TRANSACTIONS

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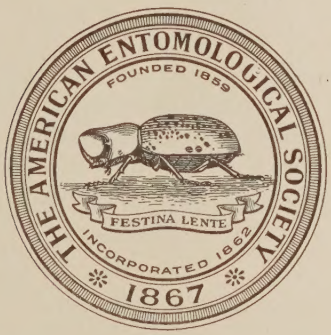

VOLUME LVI

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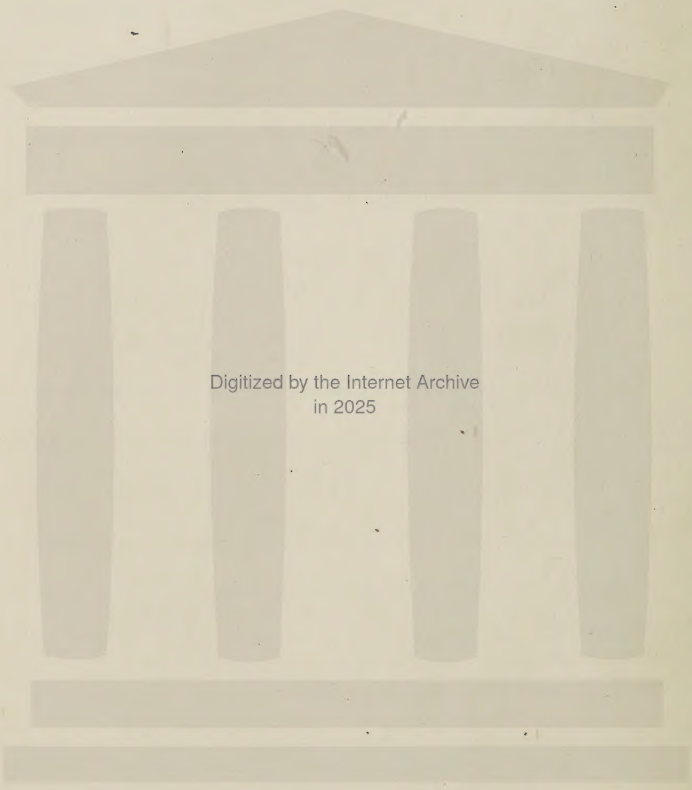
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TRANSACTIONS

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VOLUME LVI

NOTES AND NEW SPECIES OF MICROLEPIDOPTERA FROM THE MINERAL SPRINGS REGION OF ADAMS COUNTY, OHIO

BY ANNETTE F. BRAUN,

Cincinnati, Ohio

The Mineral Springs region of Adams County, Ohio, lying at the western edge of the Allegheny Plateau, includes a number of diverse habitats, varying from typical prairie, identical with that of the prairie states of the Mississippi Valley region, to the mixed forest of the Allegheny foothills. Some of its plant communities are isolated relics, with a characteristic vegetation very similar to that of remote areas; others exhibit the general regional type of vegetation. It is to be expected that such a region would yield some interesting entomological material. The limited amount of collecting done here up to this time indicates that such is the case. The microlepidopterous fauna in general shows affinities with that of the Allegheny Plateau, but some species, such as *Stenoptilia coloradensis* Fern., *Stereomita andropogonis* Braun, *Eucosma grotiana* Kearf., *Epermenia bidentata* Braun, and presumably several of the new species described below are undoubtedly western in their range.

Gelechiidae

Aristotelia lespedezae new species

Lower part of face white, head tawny brown; palpi white, second segment with black subbasal and subapical annuli, third segment longer than second, anterior edge narrowly white, a fine black line edging this on either side, and marked with basal, submedian and postmedian black bars, the last on the outer surface and occasionally on the inner surface extended to apex and sometimes produced basally to join the submedian bar. Antennae black, annulate with white. Thorax brown, the tegulae rarely darker anteriorly. Fore wings bright brown, inclining toward tawny, and in the most deeply roseate specimens, showing some of the roseate tinge in the ground color. Basal brown area uniform in color from costa to dorsum with a white spot on costa at base, and edged posteriorly by a straight oblique line of black scales to below fold. An oblique white fascia at basal fourth, dusted with fuscous and suffused with deep rose pink except toward costa. An angulated white median fascia, suffused rosy except on costa and dusted with fuscous, the large black first discal spot projecting into it from the angle of the brown ground color, and the plical spot forming a small black dot on its anterior margin; at its outer angle the second black discal spot projects as a V into the more ocherous roundish patch which divides the ground color on the cell. Opposite costal and dorsal spots at three-fourths, the dorsal entirely suffused with deep rose, the costal sometimes white near costa, these spots separated by a narrow patch of ground color and a black dash, whose inner end is marked by two or three white scales. The costal of the pair of spots is sometimes divided on costa by a black spot, and is followed by two more rosy spots, separated from it and from one another by black spots; a black dot immediately before apex; a rosy patch on termen at apex, sometimes extended to include the last costal rosy spot, and below middle of termen a smaller rosy patch, edged with black scales. Outer row of scales around apex and termen gray, followed by a pale brownish shade and outwardly a gray shade in cilia. Hind wings and cilia rather dark gray, cilia white-tipped around apex. Legs marked with alternate black and white bars. Expanse, 11 to 13 mm.

Type.—♂; Beaver Pond, Adams County, Ohio, imago July 23, 1928, (reared from a larva webbing leaves of *Lespedeza hirta*). *Paratypes.*—3 ♂, 8 ♀; Beaver Pond, Adams County, Ohio, July 17–26, 1928; 2 ♂; Natural Bridge, Powell County, Kentucky, June 20, 1922; all reared on *Lespedeza hirta.*

Type and ten paratypes in the author's collection; paratypes in the Academy of Natural Sciences of Philadelphia, the United States National Museum and Meyrick Collection.

The larvae spin webs, usually near the top of the plant; in the case of the younger larvae, the web spreads from the stem onto the underside of a leaf, and the larva leaves the upper epidermis untouched; later the web enlarges, bending and almost enveloping some of the leaves, and the entire leaf is eaten. The young larva is greenish, the older larva grayish green, with prothoracic shield black and body marked with longitudinal red lines.

There is apparently but one generation a year; larvae collected at the end of June and beginning of July in Ohio yielded imagoes July 17 to 26, 1928; the larvae of the two Kentucky specimens were found May 28 and produced imagoes June 20, 1922.

This species belongs in the *roseosuffusella* group, exhibiting the same general type of markings. The distinguishing characters of *A. lespedezae* are the uniform color of head, thorax and fore wings, especially the basal area of the fore wings, the deep rose pink, almost crimson suffusion of the pale markings (deepest in the female), and the conspicuous discal and plical spots. From *A. callirrhoda* Meyrick, its closest ally, it is in particular separated by the greater proportion of brown, the straight posterior edge of the basal brown area, which in *callirrhoda* is obtusely bent in middle, extension of second brown fascia to dorsum and differences in the apical markings.

Aristotelia psoraleae new species

Head pale drab; second segment of palpi white, with black subbasal and subapical annuli, the latter sometimes obsolete, third segment much longer, black, with anterior edge from near base to apex white, and a white spot on each face near base, a second white submedian spot usually present in females; antennae black with white annulations. Thorax drab, sometimes with median black and submedian leaden longitudinal lines; tegulae black in anterior, white or grayish in posterior half. Markings of fore wing as in *roseosuffusella*, but dorsal area below fold largely mixed with fuscous and leaden scales, the clear ocherous only remaining immediately beneath the black bars. Base of wing white, shading to fuscous and leaden on dorsum; a triangular black bar beyond extending to fold; a white fascia beyond this; median black bar truncated on fold and sending an oblique pro-

jection upward from angle into the angulated second white fascia; both white fasciae dusted with fuscous and faintly suffused with rose on dorsum, the second fascia on its outer margin at dorsum bearing a clear pink spot; blackish ground color beyond second fascia broken on disk by a round ocherous spot, indented on its inner side by the black second discal spot; a very oblique white spot at three-fourths of costa becomes attenuated in the middle of the wing often ending in an inwardly concave white line which partially encloses the round ocherous patch; its corresponding spot at tornus smaller, triangular, erect and rosy tinged; a narrow quadrate white patch over extreme apex and upper half of termen, preceded on costa by a group of black scales and followed below on termen by two similar groups of black scales which are often confluent. Cilia pale drab, basal line often black below apex, followed by a second dark gray line. Hind wings and cilia gray, the latter tinged with ocherous at base, white-tipped around apex, and marked near tips around apex with a distinct gray shade; cilia notched between veins 4 and 5 and between veins 5 and 6; membrane of wing correspondingly slightly excavated. Legs marked with alternate black and white bars, the third and fourth on hind tibiae usually confluent. Expanse, 13 to 15 mm.

Type.—♂; Turkey Creek, Adams County, Ohio, imago September 12, 1928, (reared from a larva webbing leaves of *Psoralea Onobrychis*). *Paratypes.*— 1 ♂, 4 ♀; all reared, imagoes September 9 to 12, 1928.

Type and four paratypes in author's collection; one paratype in Meyrick Collection.

Larvae nearly full grown were collected August 20, 1928 in prairie areas along Turkey Creek, in Adams County, Ohio. The larva draws the leaflets toward the upper part of the stem somewhat together, so as to form a sort of cup open upward; within and across this it stretches a web, within which it lives and feeds, leaving the lower epidermis of the leaflets intact. Hung in the main web is a denser tubular part to which the larva retreats when not feeding. A spindle-shaped cocoon, of very fine cobwebby silk, much attenuated at both ends, is spun between leaves in the breeding jar. There seems to be but one generation a year, as the food plant showed no signs of previous feeding.

Larva with head and first thoracic segment pale; a large black spot on each side of middle of thoracic shield; remaining segments with six dark reddish longitudinal stripes.

This species is closest to *A. roseosuffusella* Clem., from which it may however be easily distinguished by the general darker color, with grayish cast, especially along dorsum, and the much larger size.

Recurvaria consimilis new species

Palpi with second joint black, a narrow white annulus beyond middle sometimes obsolete, and tip white; third segment white, base very narrowly black, two black annuli, the second broader and beyond middle. Antennae black, faintly annulate. Face white, with scattered black scales on crown, head predominantly black above. Thorax and fore wings black, with scattered bluish white scales; a black spot near base of dorsum, a minute patch of raised black scales at base of fold; three larger such patches in a row, the first two below fold, the third above, each edged behind with bluish white scales, and a fourth smaller patch just beyond dorsal arm of fascia; above the second of the row a smaller similar patch; black spots on costa at basal third, middle and two-thirds; the third inwardly margins on costa a narrow sinuate white fascia, sometimes obsolete; when distinct its costal arm is curved, outwardly concave, its dorsal arm nearly straight and perpendicular. Cilia dark gray, scales at base white, black-tipped, on dorsum paler. Hind wings silvery gray, deeper toward apex, and cilia concolorous. Legs black, with white bands. Expanse, 8.5 to 9.5 mm.

Type.—♂; Mineral Springs, Adams County, Ohio, imago July 23, 1928, (reared from a miner of leaves of Jersey tea, *Ceanothus americanus*). *Paratypes.*—1 ♂, 6 ♀; Mineral Springs and Beech Fork, Adams County, Ohio, all reared, imagoes July 20 to 30, 1928.

Type and five paratypes in the author's collection; paratypes in the Academy of Natural Sciences of Philadelphia and in the United States National Museum.

Mined leaves were collected the last of June. The reddish brown mine is usually placed in the upper half of the leaf and starts as a tubular gallery, its entrance, through which the frass is ejected in the earlier mining period, covered with silk; digitately branching, but finally expanding into a blotch covering most of the tip of the leaf, with frass scattered; the blotch is sometimes formed in a new leaf, but has the same tubular entrance gallery. Pupa in cocoon between leaves or amongst trash.

A typical *Recurvaria* in venational and genitalic characters, and resembling in general appearance most closely *R. nigra* Busck. From this species it differs in the absence of purple luster, the fewer paired patches of raised scales, the pale hind wings, and smaller size. In larval habits and appearance of mine it agrees exactly with the Pacific Coast *R. ceanothiella* Braun, but the imagoes are easily distinguished.

Telphusa amelanchierella new species

Face whitish gray, head gray; palpi with second segment black outwardly, with two whitish narrow annuli, one near, the second at tip; third segment black, with two annuli and tip white; antennae dark gray, annulate with white. Thorax and fore wings gray, rather evenly dusted with bluish white scales; minute black spots at base of costa and at base of fold; blackish patches on costa at one-fourth, middle and two-thirds, the last the largest; at one-fourth an oblique row of three dots of raised black scales, the first just below costa, but included in the blackish costal patch; within the costa but included in the second costal spot is usually a minute and blacker raised dot, and beneath it on disk and in fold, raised black dots; beneath the third costal spot a pair of raised black dots at end of cell; at tornus a black or slightly darkened spot; all of the raised black dots are margined with a few brown scales; except for these brown scales, there is an entire absence of brownish tint on the fore wings. Black dots around apex at base of cilia, usually larger and more distinct on termen. Hind wings pale silvery gray, scarcely or not at all darkening toward apex; cilia concolorous, bases ocherous. Underside of body and basal segments of legs silvery; otherwise legs black, banded with white; hind tibiae silvery inwardly; hairs above faintly ocherous. Expanse, 9.5 to 10.5 mm.

Type.—♂; Mineral Springs, Adams County, Ohio, imago July 24, 1928. *Paratypes.*—3 ♂, 4 ♀; same locality, imagoes July 23 to 27, 1928, (all reared from larvae feeding between leaves of service berry, *Amelanchier canadensis*, toward the end of June, 1928.

Type and five paratypes in author's collection; paratypes in Academy of Natural Sciences of Philadelphia and in United States National Museum.

The larva is pale greenish without markings or darker tubercle spots; reddish just before pupation; pupa in silk cocoon between leaves.

At first glance the imago is almost indistinguishable from *T. fuscopunctella* Clemens; constant points of difference are, however, the absence of all brown tints except for the few brown scales edging the dots of raised black scales, and the almost uniform pale silvery color of the hind wings. In early stages, easily distinguished from that species by the different food plant and the absence of dark markings on the larva.

Stomopteryx adversa new species

Head and face black; palpi black, second segment shaded with bluish white on upper half of inner side, tip white, third segment marked with three longitudinal white lines; antennae black, a longitudinal white line on anterior edge of basal and succeeding three segments, each of following segments with a white dot on anterior and posterior sides respectively. Thorax black. Fore wings, vein 6 out of vein 7; black, with faint irroration due to paler and bluish bases of scales except along middle of wing; minute white dots at four-fifths and end of cell and on middle of fold; sometimes faintly indicated oblique fine streaks at two-thirds of costa. Cilia blackish. Hind wings and cilia dark gray. Legs dark gray, slightly bronzy, tips of hind tarsi faintly paler. Expanse, 13 to 13.5 mm.

Type.—♂; Turkey Creek, Adams County, Ohio, imago September 11, 1928, (reared from larva between leaflets of *Psoralea Onobrychis*). *Paratypes.*—4♂, 2♀; September 7 to 15, all reared, from the same locality.

Type and five paratypes in author's collection; one paratype in Academy of Natural Sciences of Philadelphia.

Nearly full-grown larvae were collected August 20, 1928, in prairies along Turkey Creek, at a time when most of the larvae had finished feeding and deserted the leaves. The margins of the opposing leaflets are brought together, so as to form a roomy chamber, with upper surfaces in. The upper epidermis and parenchyma are eaten in patches, usually chiefly on only one of the leaflets; a circular hole for ejection of frass is cut in one leaflet. On some of the smaller leaves, there is some variation in habit, with the apical leaflet also included.

Young larva: head brownish, with two posterior dorsal dots; each segment broadly banded with dark plum, sutures pale; first thoracic segment with a V-shaped mark, apex at anterior edge, ends of arms at posterior suture, on each side of V a more or less quadrate dark plum-colored spot; remaining bands darkest each side of middle, with tubercle spots darker, producing the

effect of a paler middorsal spot. In the full-grown larva the transverse bands are broken into pale spots on which lie the much darker tubercle spots.

Allied to *S. crotalariella* Busck and *S. anthyllidella* Hbn. (*palpilineella* Busck, 1903, not Chambers), and agreeing with these two species in general characters of the palpi and in wing proportions, but differing from both in the distinct discal and plical dots, and in markings of the antennae.

Stomopteryx anthyllidella Hübner

In Busck's 1903 Revision of Gelechiidae, the name *palpilineella* Chambers is applied to the small clover-leaf folding species, and the identification is based upon supposed types in the Museum of Comparative Zoology at Cambridge, representing two species, the clover-feeding *Stomopteryx* and *Aristotelia minimella* Chambers. The original *palpilineella* was described from Texas and is compared with *nigrella* in size (½ inch); the palpi are described as white with black lines. Later[1] Chambers refers to six Kentucky specimens taken at light, which he doubtfully identifies as *palpilineella*, but points out that these specimens show, instead of the fascia, opposite costal and dorsal spots. It would appear that the types at Cambridge are from this Kentucky series and do not truly represent *palpilineella*, which is a larger species, more western in distribution, with a white fascia and white palpi marked on the third segment with black lines, instead of opposite costal and dorsal spots and black palpi with apex of second segment white and third segment marked with white lines, as in the eastern clover-feeder, which is identical with the European *anthyllidella*. Comparison of the clover-feeder with European specimens by Mr. Meyrick confirms this conclusion.

Anacampsis grissefasciella Chambers

This species, placed in our lists as a synonym of *Anacampsis conclusella* Walker, is separated from that species by the presence of two black annuli, a submedian and a subapical, on the third segment of the labial palpus, and by the tendency for M_3 and Cu_{1a} (veins 3 and 4) of the fore wings to be connate or stalked. The white fascia at three-fourths is usually more sharply separated from the ground color, especially on its inner side, than is the similar fascia of *A. conclusella*. *Anacampsis conclusella*

[1] Bull. Geol. Surv. Terr., IV, 88 (1878)

(synonym *A. tephriasella* Chambers) has on the third segment of the labial palpus a subapical dark annulus, with merely a patch of scattered black dusting before middle, and M_3 and Cu_{1a} of the fore wing are always separate. Both species agree in general type of wing markings and in the peculiar markings of the antennae.

Cosmopterygidae

Cosmopteryx magophila Meyrick

1919. *Cosmopteryx magophila* Meyrick, Exot. Microlep., II, (9), p. 282.

Three specimens of this species were reared from larvae mining in leaves of *Desmodium* sp., Beaver Pond, Adams County, Ohio. Mined leaves collected July 19, 1927; imagoes August 12 to 15, 1927; one flown specimen, same locality, August 18, 1927.

The mine begins at the midrib, spreading outward and upward between two lateral veins; in that part of the early mine adjacent to the lower of the lateral veins between which it lies, the parenchyma is left in narrow transverse bars, giving the mine a very characteristic aspect; as the mine increases, it extends beyond the confines of the two veins, with irregular projections and parenchyma all consumed. Pupa formed within the mine beneath the transverse bars, which are here lined with silk forming a tubular pupal chamber.

Elachistidae

Stephensia cunilae new species

Head dark bronzy; labial palpi very short, almost minute, blackish bronzy; antennae finely pubescent in male, basal third dark bronzy, each segment of outer two-thirds marked above with a silvery spot. Thorax and extreme base of fore wing dark reddish bronzy; rest of wing dark brown almost black, with faint bronzy luster. Markings pale golden, consisting of a subbasal pale golden fascia, a second narrower fascia before middle of wing, a perpendicular spot at tornus reaching half way across the wing, a small curved costal spot beyond, and a spot at apex of wing, usually arrowhead in shape and connected with the costal spot. Hind wings and cilia dark gray. Fore and middle legs dark bronzy, hind legs blackish, with median and apical white bars on tibiae. Upper side of abdomen bronzy, under side pale golden Expanse, 6.5 to 7 mm.

Type.—♂; Beaver Pond, Adams County, Ohio, imago September 6, 1928 (reared from a blotch mine in leaves of *Cunila origanoides*). *Paratypes.*—2♂, 2♀; July 11 to 18, 1928, Beaver Pond; 1♂; September 10, Mineral Springs, Adams County, Ohio; all reared.

Type and four paratypes in author's collection; one paratype in Meyrick collection.

Mined leaves were collected at the end of June and again in the latter part of August and yielded moths in July and September respectively. The mine starts near the midrib and usually extends to the tip of the leaf, narrow at first, later expanding into a blotch, with all parenchyma consumed and frass retained within the mine. When starting near the tip of the leaf, the early mine is entirely obliterated by the blotch. A series of fine folds in the lower epidermis spreading out funnel-shaped from the earlier part crumples the leaf somewhat. The entire mine exhibits a peculiar and characteristic grayish color. The larva leaves the mine by a slit in the lower epidermis.

Larva yellowish white, with well developed thoracic legs; head black, first thoracic segment with a black transversely elliptical patch, divided in middle by a longitudinal white line. Pupa in a fold of leaf beneath a sheet of fine white silk; without the tubercles or ridges characteristic of *Elachista*. The egg, observed on the lower side of leaves mined by the second generation of larvae, is of the erect type. It is conical in shape, with perpendicular sharp ridges, and dark gray in color.

The agreement in larval habits with the only other previously known species of the genus (European), also a miner in leaves of a labiate, is quite remarkable. In imaginal structure, however, this species differs in several characters: M_1 and R_5 (veins 6 and 7) of the fore wing are coincident, and the resulting vein becomes obsolete toward apex; from its direction and shape it is derived from these two veins; it is directed slightly toward termen, at its tip thus following the course of M_1; M_3 (vein 4) of the hind wing is absent; the labial palpi are very short, almost minute, and lie close alongside the tongue. The degree of variation is however no greater than that shown in the allied genus *Elachista*.

Gracilariidae

Lithocolletis intermixta new species

Palpi white, fuscous outwardly; face white; tuft white, with occasional brownish ocherous hairs in the center, wholly brownish ocherous laterally; antennae silvery white anteriorly, pale fuscous posteriorly. Thorax and fore wings variable in ground color, brownish ocherous to golden; a broad white line across anterior margin of thorax and tegulae is continuous with a rather broad straight median basal streak, extending to just beyond one-third, and faintly dark margined toward costa in its outer half; dorsal margin narrowly white below middle portion of basal streak; four silvery white costal and three dorsal streaks, all dark margined internally. First dorsal oblique, curved, its apex opposite that of the smaller, but equally oblique, first costal; second pair perpendicular, their apices curving outward, almost in contact; third pair of streaks very narrow, especially in female, third dorsal beyond third costal, but usually joined to it by a thin silvery line across the middle of the wing. A streak of black scales in the apex is more or less overlaid anteriorly with silvery scales. Cilia whitish, marginal line brown, concolorous with dark margins of the streaks. Hind wings and cilia gray, with distinct coppery tinge. Hind legs whitish, with scarcely perceptible fuscous shading. Underside of body silvery, abdomen above gray. Expanse, 7 to 7.5 mm.

Type.—♀ ; Beaver Pond, Adams County, Ohio, imago April 25 1928. *Paratypes.*—1 ♂, 1 ♀ ; imagoes April 17 and May 1, from overwintering pupae; 1♂; imago June 29, 1927, from a mine collected June 19, 1927; all from the same locality and reared from tentiform mines on leaves of hazel, *Corylus americana.*

Type and paratypes in author's collection.

The rather large, much wrinkled tentiform mine lies between two lateral veins; most of the parenchyma is consumed, a few patches in the center only remaining; the pupa is suspended in a loose meshwork of silken threads. The overwintering pupae were collected October 6; the first spring generation mines in June; a later generation of mines has been observed at the end of August. There is a very high percentage of parasitism, making it difficult to secure a good series of the moths.

This species approaches closest to the alder-feeding species, *incanella, alni,* and *alnicolella,* but the distinctive characters are intermediate between them. From *alni* and *alnicolella* it differs

in the more oblique first pair of streaks with no tendency to the formation of a fascia; this pair of streaks is on the other hand, less oblique than in *incanella* and the dorsal of the pair is broader than in that species; from all three it is distinguished by the absence of any scattered dark dusting.

The three specimens from overwintering pupae exhibit the brighter golden ground color; the single specimen of the spring generation is much duller and more brownish.

Lithocolletis aberrans new species

Palpi white, dark brown on outer side; face white, tuft on head of white and dark brown hairs intermingled; basal segment of antennae and a few succeeding segments anteriorly white, remainder brown with whitish annulations. Thorax clothed with white, brownish ocherous and brown scales intermixed. Fore wings above a line from base of costa to tornus brownish ocherous, with scales minutely and in apex more broadly brown tipped; below this line white, with scales ocherous, brown or black tipped. Two angulated white fasciae, at one-fourth and middle of wing respectively, the costal arm the shorter and narrower; dark margined on both sides, but more broadly inwardly; dark dusting sometimes obscuring the dorsal arm of the first; the second fascia divided at its angle by a longitudinal dash of black scales; a white costal spot at three-fourths and an opposite tornal spot; the tornal margined inwardly above dorsum by a curved oblique streak of black scales, which is in turn edged inwardly with white scales; on disk at end of cell a small white spot from which an oblique black streak proceeds to costa before apex; toward costa edged above with white. Cilia white, with a line of black-tipped white scales around apex and termen. Hind wings pale silvery gray, cilia ocherous tinged. Legs white, tips of segments dark brown, posterior tibiae with conspicuous diagonal dark brown bands. Abdomen gray and brown above, silvery white beneath. Expanse, 6 to 6.5 mm.

Type.—♂; Beaver Pond, Adams County, Ohio, imago September 23, 1928. *Paratypes.*—2♂, 4♀; same locality, imagoes September 7 to 11, 1927, and September 18, 1928 (reared from miners of leaves of *Desmodium paniculatum* and *D. canescens*).

Type and five paratypes in the author's collection; one paratype in the Academy of Natural Sciences of Philadelphia.

The white blotch mines, with loosened epidermis very thin and almost pure white, are placed on the upper side of the leaf. The mine begins as a short irregular line which almost at once enlarges

to a blotch, at first much resembling that of *Coptodisca*, except that no parenchyma is eaten; as the blotch increases in extent it obliterates the early part, finally occupying half or more of a leaflet, and measuring four or more centimeters in length by one in breadth. Several mines may begin near one another, becoming confluent in the blotch stage, and thus a mine may appear to contain more than one larva. The loosened epidermis is never wrinkled, no silk being spun within the mine at any time, and no parenchyma is eaten except during the last feeding instar; during this instar—the last few days of larval life—leaf tissue over an irregular tract within the mine, or in scattered patches, in amount not over one-fourth of that available, is eaten.

The larva is a sap-feeder, except in the last instar, and retains the typical specialized mouth-parts and flattened form to within two or three days of pupation; the dark maculae on the thoracic segments are trapezoidal with the narrower side forward, more or less elliptical on seven abdominal segments, with the last spot very small. During the sap-feeding period, the mine attains its full size; at the end of this period the larva retreats away from the edge of the mine and moults. With this moult, it attains the normal cylindrical form, with the usual tissue-feeding type of mouth-parts, and well developed thoracic legs; the maculae still remain faintly visible. The larva then feeds on the leaf tissue for two or three days. Contrary to the usual habit during the tissue-feeding stages in *Lithocolletis*, no silk is spun, and the loosened epidermis is not wrinkled; the position of the cylindrical larva in the mine is plainly evident by the elevated epidermis above it. Without further moulting, it leaves the mine and spins a smooth flat whitish silk cocoon (similar to that of the flat-larval group of *Lithocolletis* or to that of *Parectopa*).

The mining period is apparently of about three weeks duration; mines collected August 21, 1928 were just beyond the linear stage; the blotch attained its full extent the first of September and cocoon spinning took place the fourth or fifth of September, with moths emerging September 18 to 23.

There is no evidence of more than one generation; all the mines observed were on leaves toward the top of the plant, near the inflorescence, indicating that the moth must live for a long period before depositing its eggs.

The very remarkable larval structure and habits of this species, which place it intermediate between the two heretofore recognized divisions of the genus, and the aberrant habit of leaving the mine to pupate, have warranted the above more extended description of the early stages. In imaginal structural characters, the species is a typical *Lithocolletis*, but from captured specimens, the student might feel some doubt as to which of the two groups of the genus to assign it. It resembles somewhat in markings and coloration, *celtifoliella* of the cylindrical-larval group, but in the angled fasciae, with straight arms, margined on both sides, black-tipped scales of the apex, bordered inwardly by an oblique black line running into the costal cilia, which in turn forms the outer border of a white costal streak, it approaches the type of marking of the flat-larval group. It thus seems in all stages to be a form intermediate between the two groups, in which the earlier less specialized habit of tissue feeding, and with it, the normal tissue-feeding larval structure have persisted only in the last feeding instar. The loss of the spinning habit while feeding is a character of the sap-feeders of the genus, but cocoon-spinning outside the mine is aberrant for both groups.

The species is apparently very rare; the few mines seen and collected were found in 1927 on two groups of plants about a quarter of a mile apart; in 1928 about a half dozen mines were obtained from one of these groups, but none were seen on the other. No other mines have been observed in the entire region, although probably several thousand plants were examined. The mine is very conspicious and would not easily escape notice.

Epermeniidae

Epermenia bidentata Braun

1926. *Epermenia bidentata* Braun, Can. Ent., LVIII, p. 48.

A single specimen of this species, previously known from the type material from Manitoba, was reared from a larva webbing and feeding in the bunches of flower buds of *Comandra umbellata*, Beaver Pond, Adams County, Ohio, April 27, 1928, and full grown at that time; cocoon a coarse brownish network; imago, May 14, 1928. This is an unusual food plant for the genus, which is generally confined to members of the Umbelliferae.

Lyonetiidae

Bucculatrix fugitans new species

Face pale straw-colored; antennal eye-caps shading from pale straw to fulvous behind; antennal stalk blackish fuscous; tuft fulvous; thorax anteriorly fulvous shading to brownish posteriorly; extreme base of fore wings fulvous, concolorous with thorax. Ground color of fore wings dark brown, almost black; a moderately broad, slightly curved pale golden fascia at one-fourth, followed just within the dorsal margin by a large black scale tuft; a pale golden oblique spot at middle of costa; an oblique golden tornal spot, and a slightly more posterior costal spot placed beyond three-fourths; a small golden spot in apex; cilia whitish, marginal line of brown scales sharply defined. Hind wings and cilia dark gray. Body beneath pale golden. Legs pale golden, hind tibiae and tarsi shaded with dark brown. Expanse, 6 mm.

Type.—♂; Mineral Springs, Adams County, Ohio, imago July 30, 1928. *Paratypes.*—4 ♀; July 20 to 23, 1928, same locality; all reared on hazel, *Corylus americana.*

Type and paratypes in author's collection.

The very fine linear mine, usually starting near the midrib, is often much contorted, especially in its earlier course, but sometimes runs straight for a half inch or more; the length of the mine depends on the texture of the individual leaf. The larva on leaving the mine, and apparently before feeding exposed, spins on the underside of the leaf, the first moulting cocoon; it then feeds from the underside of the leaf, eating at first minute holes in the leaf; the holes made by the nearly grown larvae are 3 or 4 mm. across. Very young external-feeding larva yellowish; after the second moult outside the mine green, shaded with reddish, setae very short. Cocoon reddish brown, short, stout.

The larvae from which the type series was reared were collected June 27, 1928; at that time most of the larvae had left the mines and were feeding externally. The species is not uncommon, but the larvae, because of the remarkable resemblance in coloration to the under surface of the leaf, are difficult to see.

The species is very distinct from all other species of our fauna.

Tineidae

DOLEROMORPHA new genus

Entire head densely rough-haired. Maxillary palpi long, folded, folded portion exceeding the breadth of the face; labial palpi porrected, second segment with bristly hairs outwardly near apex, and rough scales inwardly, third segment shorter than second, transversely flattened, obtuse. Tongue short. Antennae one-half the length of the fore wings; nearly smooth-scaled, whorls distinctly divergent only in apical third, finely pubescent in male. Hind tibiae smooth-scaled. Fore wings elongate ovate, all veins present; R_4 and R_5 short stalked, R_5 to costa; accessory cell present; base of R and R_s obsolete; R_1 and Cu_{1a} arising opposite one another near end of cell, cell broadened posteriorly; discal vein weak; 1st A (1b) simple; frenulum retinaculum from membrane near costa. Hind wings a little over one-half, of almost equal width throughout, costa arched, apex obtusely rounded; cilia 1; M_3 absent; Sc strong to 4/5 of costa; base of R_s obsolete, R_s to costa near apex; M_1 to termen, medial stem faint; R_s, M_1 and M_2 nearly parallel from middle of wing and equidistant; Cu_1 strongly tubular, forked opposite point of separation of R_s and M_1 and M_2, Cu_{1a} parallel to M_2, cell open between Cu_{1a} and M_2; upper fork of 1st A (1b) obsolete.

Genotype: *Doleromorpha porphyria* new species.

Doleromorpha is apparently related to *Chloropleca* Wlsm. (*Cyane* Chambers), which it approaches in configuration of veins, especially of the fore wing and of anals in the hind wing, but differs in the much narrower hind wing, with cell open between M_2 and Cu_{1a}, and the long stem of Cu_1. The form of the cell of the fore wing and position of R_2 and branches of Cu_1 suggest Incurvariid affinities, but the wings are not aculeate.

Doleromorpha porphyria new species

Head rusty ocherous; palpi pale ocherous, labial brownish outwardly; antennae black. Thorax and fore wings dark purple-brown; three lines in cilia. Hind wings pale golden brown, lustrous, paler toward base; darker and grayish tinged in female. Underside of both pairs of wings with golden luster, purple tinged in male, more deeply purple in female. Legs pale golden fuscous. Expanse, 7 to 8.5 mm.

Type.—♂; Beaver Pond, Adams County, Ohio, July 19, 1927. *Paratypes.*—5♂, 3♀; Mineral Springs and Peach Mountain, Adams County, Ohio, July 20 to 22, 1927; 1♂; Balsam, North Carolina, July 22, 1911.

Type and seven paratypes in author's collection; one paratype in Academy of Natural Sciences of Philadelphia; one paratype in Meyrick collection.

The moths usually fly in the early morning, along the borders of forest.

Nepticulidae

Nepticula exasperata new species

Tuft on face and head pale buff, bases of hairs faintly ochraceous; eye-caps silvery at base shading through pale golden to deep purple at tips and posterior margin; collar blackish purple. Thorax deep blue-purple. Fore wings deep blue-purple, showing reddish bronzy luster beneath the fold and beyond the fascia; at the middle of the wing a broad, brilliant pale golden fascia; cilia purplish gray, shading toward tips around apex to silvery white. Hind wings and cilia gray. Legs purplish bronzy; tibiae and tarsi of the middle pair silvery white. Expanse, 3.2 mm.

Type.—♂; reared from a serpentine mine on leaf of *Vaccinium vacillans*, imago August 5, 1927; mined leaf, July 19, 1927, Beaver Pond, Adams County, Ohio. In author's collection.

The egg is deposited on the underside of the leaf and the mine, which is more distinct on the upper side of the leaf, is reddish brown, 3.5 to 4 cm. in length and gradually increasing to a breadth of a little over one millimeter; frass in a broad tract through the middle of the mine. The larva leaves by a slit in the lower epidermis; cocoon dark reddish brown.

There are two generations a year; mining larvae may be collected in the first half of July and in the latter half of August. The species seems to be rather general on *Vaccinium* and *Gaylussacia*, but is never common. Mines of identical appearance have been observed in North Carolina on *Azalea* and *Lyonia* as well as on *Vaccinium* and *Gaylussacia*.

Nepticula exasperata is nearest to *N. rosaefoliella* Clemens, but differs from it in the pale tuft on the head, the more conspicuous blue and bronzy luster of the fore wings, and the much broader fascia. It is very different from the other feeder on ericaceous plants, *N. paludicola* Braun.

NEW OR LITTLE KNOWN NEOTROPICAL BLATTIDAE

(ORTHOPTERA)

NUMBER TWO

BY JAMES A. G. REHN

The introductory remarks given in Number One of this series [1] present the reasons for the appearance of this set of studies.

The present number contains the descriptions of three new genera and fourteen new species, and discussions of nine previously known species. Two genera, i.e. *Lamproblatta* and *Muzoa*, are revised in their entirety and a section of another genus (*Pelmatosilpha*) is similarly treated.

The species here discussed are: (Pseudomopinae) *Cariblatta faticana* new species, Cuba, *Pseudosymploce personata* new species, Porto Rico, *Nesomylacris fratercula* new species, Cuba; (Blattinae) *Lamproblatta zamorensis* (Giglio-Tos), *L. mimetes* new species, Brazil, *L. albipalpus* Hebard, *L. gorgonis* new species, Colombia, *L. ancistroides* new species, Venezuela and Colombia, *L. romani* new species, Brazil, *L. meridionalis* (Bruner), *Pelmatosilpha rotundata* Scudder, *P. macu* new species, Brazil, *P. miranha* new species, Peru, *P. alaris* (Saussure), *P. guianae* Hebard, *P. lata* Hebard, *P. aterrima* (Walker), *Eurycotis lixa* new species, Jamaica, *E. improcera* new species, St. Croix, Virgin Islands; (Nyctiborinae) *Muzoa simplex* Hebard, *M. madida* new species, Costa Rica; (Epilamprinae) *Dryadoblatta* new genus; (Perisphaerinae) *Nauclidas* new genus, *Poroblatta pluto* new species, Venezuela, *Styphon bakeri* new genus and species, Curaçao, Bonaire and Aruba, Dutch West Indies.

[1] Trans. Amer. Entom. Soc., LIV, pp. 125–194, (1928).

PSEUDOMOPINAE

Cariblatta faticana new species (Pl. I, figs. 1 and 2.)

A very distinct and strikingly differentiated member of the Cuprea Group of the genus,[2] differing from the other group members, i.e. *cuprea* and *punctipennis* Hebard and *orestera* Rehn and Hebard, in the elongate form, much narrower and far less transverse pronotum, narrower tegmina, narrower marginal field and much more attenuate and elongate anal field of the same. This species is so very distinct that I have no hesitation in describing it without seeing the male sex, which doubtless has important differences in the genitalia.

In size *faticana* is nearly as long as the same sex of *orestera*, but is far more slender, and while it is no broader than *cuprea* or *punctipennis* it is distinctly longer.

Type.— ♀ ; Turquino Peak, Sierra Maestra, Oriente Province, Cuba. Elevation, 900–1000 meters. July 20, 1922. (S. C. Bruner and C. H. Ballou.) [Academy of Natural Sciences of Philadelphia, Type no. 5486.]

Size medium (for genus); form elongate and slender, more attenuate than in related species.

Head elongate cordiform, slightly deeper than broad across eyes (as 37 to 35), latter moderately prominent, lateral margins of face ventrad of same appreciably convergent toward mandibular bases; occipital outline in cephalic aspect moderately arcuate, interspace between eyes at occiput one and one-sixth times as broad as that between internal borders of antennal scrobes (as 14 to 12): face moderately convex in transverse section, occiput rather broadly rounding into same over region of frons. Palpi relatively elongate, slender; antepenultimate article very faintly longer than penultimate article (as 12 to 11), former with parallel margins, latter slenderly infundibuliform; ultimate article about five-sixths as long as penultimate (as 9 to 11), subsecuriform.

Pronotum relatively narrow, very short, slightly transverse subhexagonal-ovate in outline, greatest length equal to four-fifths of greatest pronotal width (as 48 to 61): cephalic margin relatively broad and moderately arcuate, laterad rather narrowly passing into the obliquely arcuate, caudad diverging lateral sections, which broadly round over point of greatest width, which is at caudal third, and in the full curvature of a quadrant pass into the broad, very gently arcuate caudal margin: surface of pronotum appreciably deplanate, weakly declivent laterad on disk and over hyaline lateral areas, latter faintly concave latero-

[2] Bull. Amer. Mus. Nat. Hist., LIV, p. 13, (1927).

cephalad; disk relatively broad, lateral hyaline sections proportionately narrow, particularly cephalad.

Tegmina elongate, greatest width contained nearly four times in greatest length (as 29 to 110), greatest width at apex of anal field: costal margin very gently arcuate to point of greatest width, thence distad nearly straight oblique to the rather narrowed but still well rounded apex; sutural margin nearly straight, briefly arcuate proximad and distad to apex: marginal field very narrow, reaching distad to point of greatest width; anal field very elongate and attenuate pyriform in shape, its greatest width contained nearly three times in greatest length of field (as 15 to 43): costal veins twelve to fourteen in number, those distad ramose, rami included in the count given; discoidal sectors seven, two of these being the bifurcate ulnar vein, one a very short distal ramus of the discoidal vein, the remainder arising from median vein; anal sulcus straight for more than half its length, distad very briefly rounding to sutural margin; axillary veins four in number, all nearly straight, moderately converging distad; in distal third of tegmina most of costal veins in their proximal sections bear on their dorsal surface a single low rounded node, such as is found in *C. punctipennis*, while an irregular series of similar nodes are seen on certain discoidal sectors in the same portion of the tegmina, as many as three being present on a single sector, while their relative disposition, irrespective of their position on individual sectors, is in longitudinal series. Wings with anterior field relatively narrow; costal veins 11 to 13 in number, the more proximal markedly elongate clavate, the series distad becoming simple in character; medio-discoidal area relatively narrow, as a whole slightly narrower than medio-ulnar area, divided by straight cross-nervures into nine quadrate or rectangulate areolets; ulnar vein biramose, one ramus quite distal in position.

Ultimate abdominal tergite (supra-anal plate) transverse, its distal margin moderately arcuate with a marked median rectangulate emargination extending well into the tergite. Cerci incomplete, apparently quite elongate, articles distinctly marked off by their individual form, each article independently narrowing proximad; cerci subdeplanate dorsad. Ultimate sternite (subgenital plate) elongate, acute scoop-shaped, ventrad distinctly convex transversely; distolateral margins converging, moderately sigmoid, apex subacute, very narrowly rounded.

Limbs as usual in genus. Caudal metatarsus occupying nearly two-thirds of entire tarsal length (as 32 to 54), entire tarsus very slender.

General color pale ochraceous-buff with a yellow ocher tendency on the tegmina, and a touch of zinc orange on the pronotal disk; abdomen approaching pale buckthorn brown, stigmatic spots

prout's brown, ultimate sternite largely clouded with russet; pronotal disk without pattern except a median spaced pair of small buckthorn brown trigonal spots, which may be structural and not pigmental in character. Occipital transverse interocular bar, another with a trefoil curvature to its dorsal border placed between dorsal portions of antennal scrobes, a third broken chain between internal borders of scrobes, and spots ventrad of scrobes and across lower face, cinnamon-brown; occipital (i.e. dorsal) margin of interocular dark bar irregularly defined, the cloud of the bar blending into general tone of occiput; pale multisigmoid transverse bar across frons warm buff, strikingly contrasted; eyes chestnut.

Length of body, 8.6 mm.; length of pronotum, 2.01; greatest width of pronotum, 2.56; length of tegmen, 9.24; greatest width of tegmen, 2.43.

The type of this very striking and unusual species, so distinct in its general form, is unique.

Pseudosymploce personata [3] new species (Pl. I, fig. 3.)

The present species is very distinct from the two which definitely have been referred to this genus, i.e. *elongata* (Beauvois), from Hispaniola, and *schistopyga* Rehn and Hebard, from Jamaica.[4] Its relationship to Bolivar's *"Ischnoptera" excisa*, from Cuba[5], which Rehn and Hebard tentatively referred to *Pseudosymploce*,[6] may prove to be closer than to the other species when physical comparison is possible, but from Bolivar's description *personata* is seen to differ from *excisa* in at least the following features: smaller size, more strongly transverse and cephalad arcuate pronotum, pale lateral and cephalic pronotal borders and marginal and costal portion of scapular fields of tegmina, and the fewer (3–4 instead of 5) complete rami of the ulnar vein of the wing.

From *P. elongata* and *schistopyga* the present species can at once be distinguished by its heavier, more robust build, bicolored coloration, decidedly more transverse and polished pronotum, more corneous and polished tegmina, which have the intercalated nervures subobsolete in the normally exposed areas, in the greater

[3] In allusion to the dark upper face.

[4] See Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., LIV, pp. 103–110, (1927).

[5] Mém. Soc. Zool. France, I, p. 124, (1888).

[6] Bull. Amer. Mus. Nat. Hist., LIV, p. 108, (1927).

width of the tegmina, which have a greater number of discoidal sectors, and in the heavier limbs. From *elongata* the new species also is separable by the trigonal form of the ultimate tergite (supra-anal plate) of the female.

When the male sex of *personata* is secured doubtless important features of difference from the other species of the genus will be found. While I am generally opposed to the description of species of blattids of this subfamily from the female sex alone, the present species is so remarkably distinctive in ambisexual characters its description at this time is fully justified.

Type.— ♀ ; Loquillo National Forest, Porto Rico. Elevation, 1500 feet. November 17, 1925. (F. E. Lutz, at headquarters cabin.) [American Museum of Natural History.]

Size large (for genus); form robust, relatively broad, fully alate; surface polished.

Head reversed pyriform in outline, deep, greatest width across eyes contained nearly one and one-fourth times in greatest depth of head (as 70 to 88); eyes faintly obtuse-arcuate laterad of antennal scrobes, their outline not differentiated in contour from remainder of head outline, which dorsad is broadly arcuate between points of greatest width; occipital interspace between eyes bordered laterad by the parallel internal margins of the eyes, in width equal to nearly four-fifths interspace between internal margins of antennal scrobes (as 23 to 30). Eyes in profile subreniform, strongly arcuate in outline, regularly narrowing ventrad to narrow but well rounded ventral border. Antennae in incomplete condition nearly as long as body, well supplied with setae. Palpi relatively slender; antepenultimate article and ultimate article subequal in length, latter elongate shallow subsecuriform, in dorsal view weakly inflated; penultimate article appreciably shorter than ultimate (as 19 to 23), distinctly infundibuliform.

Pronotum distinctly transverse, ovate, greatest length contained one and one-third times in greatest width of pronotum (as 54 to 72), which latter is briefly caudad of middle of pronotum; cephalic and lateral margins of pronotum broadly and regularly arcuate between points of greatest width, latter very broadly arcuate, the margins evenly curving to rounded obtuse caudolateral angles, over which they pass to the broad, very gently arcuate caudal margin; all margins narrowly cingulate: surface of pronotum in longitudinal section but faintly convex, in transverse section subdeplanate mesad on disk, markedly convexly deflexed laterad; subobsolete cephalad diverging depressions present laterad on disk.

Tegmina with apices incomplete, but in this condition surpassing the apex of the abdomen by a distance nearly equal to the pronotal length, in texture polished subcorneous with fully developed and clearly indicated venation, which, however, is less elevated and evident than in *P. elongata;* greatest width of tegmen nearly equal to that of pronotum; form of margins and disposition of veins essentially as in *P. elongata,* discoidal sectors twelve in number: marginal field less cribroso-punctulose than in *P. elongata;* anal field proportionately shorter and stockier than in *P. elongata.* Wings with apices incomplete, number of costal veins not determinable on account of damage; medio-discoidal area proximad of bifurcation of discoidal vein appreciably broader than adjacent section of medio-ulnar area, distad of same point hardly broader than latter there; ulnar vein with four complete and three incomplete rami; axillary vein biramose.

Abdomen with ultimate tergite (supra-anal plate) moderately transverse, trigonal produced, lateral converging margins of same faintly concave, apex narrowly rounded with a faint median emargination, proximad of which extends, for half length of tergite, a narrow subequal slot in the chitin, closed by a hyaline membrane. Cerci similar to but somewhat more robust and shorter than in *P. elongata.* Ultimate sternite (subgenital plate) moderately large, in transverse section regularly and strongly convex, distal margin broadly arcuate in ventral aspect.

Cephalic femora with spines of proximal group of ventro-cephalic margin five in number, piliform series of same margin covering more space than in *P. elongata.* Median and caudal femora relatively robust; caudal tarsi in type lacking distal article, remainder as in *P. elongata.*

General color of pronotum except lateral and cephalic margins, all of tegmina except marginal field and a progressively subobsolete continuation of the same along the costal border of the scapular field, solidly liver brown passing to pale hay's russet distad on the tegmina, the liver brown darkest laterad and cephalad on the pronotum; pale borders of the pronotum and costal portion of tegmina contrastingly apricot yellow to maize yellow, the former on the pronotum, passing to the latter on the tegmina; cingulate lateral and cephalic borders of pronotum and cingulation of costal margin of tegmina very narrowly pale tawny. Base color of venter, head and limbs weak ochraceous-orange, progressively infuscate with liver brown on abdomen, ultimate sternite almost entirely of this shade; abdominal sternites paler laterad than on disk. Head with eyes pitch brown; occiput and frons ventrad to between ventral margins of antennal scrobes solidly liver brown, paling near the transversely arcuate ventral margin of the maculation; ocellar spots apricot yellow; antennae prout's brown; palpi of ventral color with penultimate

article narrowly clouded proximad and ventrad with prout's brown. Limbs darkening to russet distad, particularly on caudal tibiae, this most evident on extensor surface of tibiae and with greatest emphasis narrowly proximad on same surface; limb spines tawny to russet. Dorsal surface of abdomen liver brown, throughout narrowly bordered laterad with apricot yellow. Cerci liver brown, narrowly pale yellowish dorso-distad.

Length of body, 15 mm.; length of pronotum, 4.53; greatest width of pronotum, 6.04; length of tegmen, 16;[7] greatest width of tegmen, 5.46.

The very distinctive proportional and color features of this species, as well as the equally characteristic form of the ultimate abdominal tergite of the female, will at once serve to separate this beautiful species from its more slender and uniformly colored relatives. The type is unique.

Nesomylacris fratercula new species (Pl. I, fig. 4.)

The present species of this interesting genus[8] is based on an imperfect specimen, but sufficient features of difference are readily evident to make its separation not at all difficult. From both the previously known species the present insect can be distinguished by its smaller size and the narrow trigonal form of the median portion of the ultimate tergite (supra-anal plate) of the male. In addition from *N. cubensis* of western Cuba (Pinar del Rio Province) the present species differs in the subquadrate tegmina, in the alar slips being smaller and normally covered, in the less deplanate face, in the transversely subtruncate instead of markedly emarginate distal margin of the seventh tergite of the male, and in the strongly bicolored pronotum. From *N. relica* of Jamaica, which is probably its nearest relative, *fratercula* also differs in the less squarely truncate distal extremity of the tegmina, in the broader marginal field of the same, and in the pronotal color pattern and the solidly pale lateral borders of the dorsal and ventral surfaces of the abdomen. Doubtless important differences in the structure and appendages of the distal abdominal sternite (subgenital plate) of the male will be found upon the acquisition of more perfect material.

[7] This measurement is of the damaged tegmen. By analogy I would say that a section from three to five millimeters long is missing.

[8] See Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., LIV, pp. 7, 137, (1927).

Type.—♂; Camagüey, Camagüey Province, Cuba. July 30, 1923. (J. Acuña.) [Academy of Natural Sciences of Philadelphia, Type no. 5487.]

Size relatively small, form as usual in genus; surface polished.

Head in facial aspect broad cordiform, greatest width across eyes subequal to greatest depth of head (as 44 to 45), eyes in outline moderately prominent laterad, but dorsad broadly and evenly rounding into and across occiput, which latter is faintly flattened: occipital interspace between eyes very broad for male sex, hardly narrower than that between internal margins of antennal scrobes (as 19 to 20), in profile broadly rounding over frons into face, which ventrad of the ocellar spots is flat in profile. Eyes in lateral view relatively short, reniform, broad dorsad and distinctly narrowing ventrad. Antennae incomplete. Palpi resembling those of *N. cubensis* but more slender and elongate; ultimate article proportionately longer, about one and one-third times as long as penultimate article (as 17 to 13), shallow acute securiform; antepenultimate article one and one-fourth times as long as penultimate article (as 16 to 13), faintly arcuate in profile.

Pronotum semi-ovate trapezoid in outline, moderately transverse, greatest median length contained slightly more than one and one-third times in greatest caudal width of same (as 64 to 87): cephalic margin subtruncate dorsad of head, obtusely rounding laterad into the moderately oblique, arcuate lateral margins; caudo-lateral angles rounded rectangulate; caudal margin very broad, transversely truncate with a subobsolete, very low and broad median lobulation; cephalic and lateral margins cingulate, cephalic more narrowly so: in transverse section the pronotum is strongly convex dorsad, slightly subdeplanate mesad and strongly arcuate declivent laterad, in profile dorsum is faintly convex.

Tegmina quadrate, greatest length (costal) and greatest width subequal, reaching distad only to base of second tergite of abdomen, very narrowly overlapping suturad: costal margin very gently arcuate; disto-costal angle narrowly rounded rectangulate; distal margin straight, very weakly oblique retreating toward sutural margin; disto-sutural angle narrowly rounded; sutural margin straight except for brief proximal marked arcuation: marginal field broad, regularly narrowing distad, reaching to disto-costal point of tegmen: humeral trunk evident but not elevated, remainder of tegminal venation present but not strongly evident, not elevated. Wing slips clearly defined, articulate, lateral, hardly longer than metanotum, completely covered by tegmina.

Abdomen broad, deplanate dorsad, distad arcuately declivent longitudinally: ultimate tergite moderately transverse, trigonal produced mesad, lateral portions of distal margin in greater (mesal) part of their length concave, apex very shallowly but distinctly transverse concave emarginate; surface of tergite

moderately depressed intermarginally laterad. Cerci lacking. Ultimate sternite (subgenital plate) damaged.

Cephalic femora with spine series of ventro-cephalic margin as described for *N. cubensis*. Median and caudal femora strongly spined. Caudal tarsi lacking.

Base color ranging between pale ochraceous-buff and ochraceous-orange; dorsal and ventral disks of abdomen and pronotal markings deep mummy brown. Frons with a pair of circular clouded spots of tawny; eyes prout's brown; remainder of head ochraceous-buff. Pronotum with pale base color, which forms a very broad lateral and cephalic border, paler laterad than elsewhere; disk with its dark color divided virtually in two by an obscurely sublyrate pattern of paler tone, i.e. deep zinc orange, the dark discal pattern not reaching caudal margin of pronotum, caudo-lateral points of same, however, very closely approaching the margin. Tegmina unmarked, dull ochraceous-buff. Abdomen with lateral borders of both surfaces pale ochraceous-buff, the dorsal borders nearly half again as wide as the ventral, cingulations of immediate lateral borders pencilled in mars brown; caudal margins of tergites within the area of dark discal coloring narrowly lined with ochraceous-tawny, this virtually absent from penultimate visible tergite; sternites faintly lined in a similar fashion: ultimate tergite (supra-anal plate) dark with a medio-longitudinal, proximally acute pale patch on distal two-thirds. Limbs ochraceous-buff, spines ochraceous-tawny; median and caudal coxae with a spot of dark color, this larger on caudal pair.

Length of body, 7.14 mm.; length of pronotum, 2.77; greatest width of pronotum, 3.61; length of tegmen, 2.18; greatest width of tegmen, 2.26.

The type of this very distinct species is unique.

BLATTINAE

The Genus Lamproblatta

The genus *Lamproblatta* was erected by Hebard in 1919[9] to include three species, i.e. *Blatta* (*Stylopiga*) *meridionalis* Bruner,[10] from Trinidad; *Stylopyga zamorensis* Giglio-Tos,[11] from the valley of Zamora, eastern Ecuador; and *Lamproblatta albipalpus*, new species, from northeastern Colombia and Panama, which latter was selected as the genotype. Since the generic description more

[9] Trans. Amer. Entom. Soc., XLV, p. 108; [♂, ♀].

[10] Jour. N. Y. Entom. Soc., XIV, p. 141, (1906); [♂, ♀].

[11] Bollett. Mus. Zool. Anat. Comp. Torino, XIII, no. 311, p. 10, (1898); [♀].

material has become available for study, and the work of determining a species belonging to the genus made necessary a re-examination of all in hand.

This review brought out the fact that several corrections in the published literature are necessary, and that four undescribed species are present in the available series. The present resumé is presented as a summary of our knowledge of the species which belong to the genus.

The seven species which I distinguish can be separated into two groups by the character of the palpi, one group having them robust in both profile and extensor aspect, with the penultimate article but moderately narrowing proximad and the antepenultimate rather heavy. This group includes *zamorensis* (Giglio-Tos), *mimetes* new species and *albipalpus* Hebard. The second group has the palpi more slender in both profile and extensor aspect, with the penultimate article markedly narrowing proximad, and the antepenultimate proportionately more slender than in the first group. The new species *gorgonis*, *ancistroides* and *romani*, and *meridionalis* (Bruner) are the components of the second group.

The species *zamorensis* and *gorgonis* are large forms of which the female sex alone is known. The former species belongs to the group of the genus with robust palpi, while *gorgonis* is a member of the group with elongate, slender palpi. The new species *mimetes* and *albipalpus* Hebard are readily distinguishable by the shape of the distal tergite (supra-anal plate) of the male, the form of the distal sternite (subgenital plate) and of the apex of the genital hook of the same sex.

The large species *gorgonis* is at once separable from the other members of its group by its greater size, while the head is also less elongate pyriform, and is broader ventrad of the eyes.

The new species *ancistroides* and *romani* are separated by the form of the apex of the genital hook and of the distal sternite (subgenital plate) of the male, while *meridionalis* has the form of the distal tergite (supra-anal plate) of both sexes very distinctive, quite different from the condition found in known sexes of other species of the genus.

The linear sequence of the species of *Lamproblatta* would be as in the following treatment.

Lamproblatta zamorensis (Giglio-Tos) (Pl. I, figs. 5 and 6.)

1898. *Stylopyga zamorensis* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, XIII, no. 311, p. 10. [♀; Valle de Zamora, eastern slope of Ecuadorian Andes.]

PERU: Puerto Bermudez, Rio Pichis. July 12–19, 1920. (Cornell Univ. Exped.) 1 ♀. [Hebard Collection.]

This specimen is slightly larger than the original measurements and the ferruginous areas on the limbs are more restricted than in the type, the tarsi, trochanters and extreme distal margin of the coxae alone being so colored, the remainder of the coxae of the general blackish piceous. The apex of the distal tergite of the abdomen (supra-anal plate) is concavo-emarginate instead of "profounde angulatim incisa" as originally described. I feel this is an individual peculiarity and not a feature of specific difference.

Lamproblatta mimetes[12] new species (Pl. I, figs. 7–9; pl. II, fig. 1.)

This species is related to *L. albipalpus* Hebard, having the same general proportions of the palpal articles and the metatarsi broadened in the male sex, but readily separable from *albipalpus* by the strongly transverse distal tergite (supra-anal plate) of the male, which has its greatest distal width equal to one-half the proximal width of the sternite, instead of distinctly less than half of proximal width as in *albipalpus*, by the distal sternite (subgenital plate) of the same sex having the interstylar section equal to half the greatest proximal width of the sternite, and greater than the distal width of the distal tergite, instead of the interstylar section being less than half the width of the proximal section of the sternite and subequal to the distal width of the distal tergite (supra-anal plate), while the apex of the genital hook of the male has the angle of the bend produced into a marked and acute process, instead of narrowly rounded as in *albipalpus*.

Type.—♂; Cuyabá, Matto Grosso, Brazil. [Hebard Collection, Type no. 1158.]

Size medium (for genus): form and texture as in *zamorensis*. Head with occipital interspace between eyes broad, slightly greater than that between internal borders of antennal scrobes; ocellar spots marked, but not very large. Palpi of robust type; penultimate article infundibuliform, even appreciably so in

[12] From μιμητης, *an impostor*, in allusion to the resemblance of *Lamproblatta* to immature individuals of other genera.

extensor aspect, in length subequal to antepenultimate article; ultimate article distinctly securiform in profile, in length slightly shorter than penultimate article (as 11 to 13).

Pronotum, mesonotum and metanotum as in *L. albipalpus.*

Abdomen with its greatest width but slightly more than the width across metanotum, lateral margins subparallel in proximal half; tergites two to seven with caudo-lateral angles rectangulate, not more than very faintly produced. Distal tergite (supra-anal plate) transverse, symmetrically trapezoidal, greatest median length contained nearly three and one-half times in greatest proximal width (as 14 to 47); lateral margins of tergite converging, weakly arcuato-concave, distal margin in width nearly equal to one-half proximal width of tergite, transversely emarginato-truncate, caudo-lateral angles rounded obtuse; surface of tergite subdeplanate except immediately proximad, a low rounded medio-longitudinal swelling or subcarination indicated, immediately distal portion of tergite not completely chitinized. Cerci fusiform, three times as long as median section of distal tergite. Apex of genital hook distinctively shaped (see plate I, fig. 19), the "heel" produced distad into a marked process. Distal sternite (subgenital plate) subsymmetrical; interstylar section of distal margin in width equal to half that of entire sternite, distinctly arcuate produced, its ventral surface cribroso-punctate; sinistral (prestylar) portion of margin somewhat more lamellate than the corresponding dextral portion, more reflexed laterad, the border of these portions distinctly arcuate as seen from venter; styles as in *L. albipalpus,* with the sinistral slightly the more robust, both simple, tapering, acute.

All limbs with metatarsi inflated, but more longitudinally so and less bulbously than in *L. albipalpus;* caudal metatarsus distinctly longer than succeeding joints (as 37 to 28), in profile its ventral outline being straight for the entire length of the pulvillus, which reaches proximad for two-thirds of the metatarsal length, instead of but half as in *L. albipalpus.* Cephalic and median metatarsi show relatively the same type of development as the caudal, with the ventral margin distad straight and the whole less bulbous in appearance. The pulvilli are not broad and concave as in *albipalpus,* but instead are narrow and compressed, but with bordering spinules as in *albipalpus.*

Color uniform pitch black, the limbs paling on portions of the coxae to ochraceous-buff, and on the distal tarsal joint to hazel; limb spines hay's russet. Palpi pale yellow-orange. Mouthparts washed with honey yellow. Ocellar spots mustard yellow. Eyes cinnamon-brown.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum
♂, *type*	18.5	5.9	8
♂, *paratype*	19.6	5.9	7.5[13]

In addition to the type, I have before me a paratypic male and an immature female, both bearing the same data as the type, and from the Hebard Collection. The paratypic male agrees with the above description of the type except that the cerci are slightly shorter (two and two-thirds times as long as median length of distal tergite), and the interstylar section of the distal margin of the distal sternite (subgenital plate) is more broadly and regularly arcuate. These differences are purely individual and in all their essential features the paratypic male and the type fully agree.

The immature female is in the instar preceding maturity, and very slightly smaller than the type. The distal exposed sternite (subgenital plate) bears distad a medio-longitudinal weak rounded sulcation, indicating the line of cleavage of the valves in the adult condition.

Lamproblatta albipalpus (Hebard) (Pl. I, figs. 10–13; pl. II, fig. 2.)

1919. *Lamproblatta albipalpus* Hebard, Trans. Amer. Entom. Soc., XLV, p. 109, pl. 17, figs. 7–9. [♂, ♀; Gatun, Obispo Station, Five miles west of Empire, and Corozal, Canal Zone, Panama; Old Panama, Taboga Island, and Tabogilla Island, Panama; Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia (type locality); Venezuela.[14]]

I have before me most of the material which served as the basis for this species, including the type, allotype and paratype. As shown below the Venezuelan specimen originally included is distinct, belonging to a new species here described. Also the male specimen from Villavicencio, Colombia, subsequently reported by Hebard as *albipalpus*,[15] represents the same species as the Venezuelan individual.

The form of the apex of the genital hook of the male is much as in *L. ancistroides*, but the differences in the palpi, in the form of

[13] Pronotum faintly compressed.

[14] Equals *ancistroides* new species, which see.

[15] Trans. Amer. Entom. Soc., XLVII, p. 142, (1921).

the distal tergite (supra-anal plate) and the distal sternite (subgenital plate) of the male serve to separate the two species.

Lamproblatta gorgonis new species . (Pl. I, figs. 14–16.)

While *gorgonis* is fully typical of the group of the genus with elongate, slender palpal articles, it has the head less elongate pyriform, distinctly broader ventrad of the eyes, with the genal outlines as seen in cephalic aspect more bullate arcuate, much as in *L. albipalpus*. From the other members of its group *gorgonis* can at once be separated by its markedly larger size and also the head proportions mentioned above. The form of the distal abdominal tergite (supra-anal plate) of the female is as in *romani*, and not of the type found in *meridionalis*, while the caudal metatarsi are shorter, compared with the succeeding joints, than in *romani*. From *ancistroides*, which is known only from the male sex, *gorgonis* can be distinguished also by the more elongate ultimate article of the palpus and the more acute caudo-lateral angles of the abdominal tergites.

From the only species of the genus approaching it in size, i.e. *zamorensis*, the palpal features will at once separate *gorgonis*.

Type.— ♀ ; Gorgona Island, off the west coast of Colombia.[16] July, 1924. (Miss Cheesman.) [British Museum of Natural History.]

Size large; form more elongate than in *zamorensis*, relative proportions as in *romani*.

Head relatively broad, short pyriform; lateral outlines of genae full and arcuate as seen in cephalic aspect; occipital interspace between eyes very broad, appreciably wider than distance between internal borders of antennal scrobes (as 36 to 22). Palpi elongate, slender; penultimate article distinctly infundibuliform, in extensor aspect becoming very slender proximad, in length subequal to antepenultimate article; ultimate article subequal to penultimate article in length, in shape securiform.

Form of pronotum, mesonotum and metanotum very much as in *zamorensis*.

Abdomen in proximal half with lateral margins subparallel and there hardly broader than thoracic segments, distal half of abdomen roundly narrowing; all tergites with caudo-lateral angles somewhat acute, becoming progressively more acute to spiniform-acute, and moderately produced. Distal tergite (supra-anal plate) transverse trigonal, greatest median length contained nearly three times in greatest proximal width (as 20 to 58);

[16] Position 2° 59′ N, 78° 20′ W.

lateral margins of tergite convergent, weakly arcuate-convex, distal extremity rather broadly but shallowly arcuate-concave, same broadly rounding into lateral margins; surface of tergite broadly low tectate, no distinct ridge developed. Cerci fusiform, slightly more than twice median length of distal tergite. Distal sternite (subgenital plate) with valves projecting distad of distal tergite a distance equal to half median length of latter.

All limbs with metatarsi compressed, uninflated, not at all bulbous, subequal in depth throughout their length; caudal metatarsus distinctly longer than remaining articles of the caudal tarsus, being nearly one and one-half times as long (as 50 to 36), in profile its ventral margin straight for the entire length, the pulvillus being small and entirely distal, not at all extending proximad, the spinule series marked and extending nearly to the base of the metatarsus.

General color uniform pitch black, passing to deep maroon on the coxae, femora and distal sternite, darkening again on the tibiae, then paling on the tarsi. Antennae passing from maroon proximad to ochraceous-buff distad. Palpi solidly naphthalene yellow.

Length of body, 25.5 mm.; length of pronotum, 7.2; greatest width of pronotum, 9.9.

The type of this striking species is unique. It is interesting to note zoögeographically that the present species is not intimately related to the Panamanian and northeastern Colombian *L. albipalpus*, but is more nearly related to those forms of the Orinocan, Amazonian and Guianan regions.

Lamproblatta ancistroides[17] new species (Pl. II, figs. 3 and 4.)

1919. *Lamproblatta albipalpus* Hebard, Trans. Amer. Entom. Soc., XLV, p. 111. (In part.) [♂ (given in error as ♀); Venezuela.]

1921. *Lamproblatta albipalpus* Hebard, Trans. Amer. Entom. Soc., XLVII, p. 142. [♂; Villavicencio, Intendencia del Meta, Colombia.]

This species has much the general appearance of *L. albipalpus*, but is proportionately more slender, the abdomen being less transverse, the disto-lateral angles of the fifth to seventh abdominal tergites are less acute produced, the palpi are distinctly more slender, as noted above, and the distal sternite (subgenital plate) of the male has the interstylar margin somewhat broader and appreciably flatter. Unfortunately all the available material of *ancistroides* lack caudal tarsi, so the extent to which the metatarsi are broadened in this species cannot be determined.

[17] From ἀγκιστροειδής, *hook-shaped*, in allusion to the apex of the male genital hook.

When compared with *L. romani,* described below, *ancistroides* is seen to differ in the form of the distal abdominal sternite (subgenital plate) of the male, which has its sinistral flange larger and as in *L. albipalpus,* in the less deplanate distal tergite (supra-anal plate) of the male, and in the non-produced angle of the genital hook of the male, in this respect agreeing with *L. albipalpus.*

Type.—♂; Villavicencio, Intendencia del Meta, Colombia. December, 1918. (A. Maria.) [Hebard Collection, Type no. 1159.]

Size slightly larger than in *L. albipalpus;* form less robust, more elongate and proportionately narrower.

Head in structure agreeing with *L. albipalpus.* Palpi of slender type; penultimate article strongly infundibuliform, narrowing decidedly proximad, where it is quite slender, in length subequal to antepenultimate article, which latter is slender and subequal in width; ultimate article elongate securiform, slender, in length distinctly shorter than the penultimate article (as 10 to 13).

Pronotum as in *L. albipalpus;* mesonotum and metanotum proportionately narrower.

Abdomen narrower than in *albipalpus;* tergites two to seven with caudo-lateral angles faintly less produced than in *L. albipalpus,* but distinctly more so than in *L. mimetes.* Distal tergite (supra-anal plate) resembling that of *L. albipalpus,* the distal margin, which is less than a third as wide as the greatest proximal width (as 12 to 40), shallowly emarginate with the disto-lateral angles well rounded; surface of tergite well and broadly impressed on each side of a low medio-longitudinal swell-like tectation, immediately distal section of plate narrowly incompletely chitinized. Apex of genital hook as in *L. albipalpus.* Distal sternite (subgenital plate) with interstylar section of the distal margin in width equal to two-fifths of entire sternite (as 16 to 40), transversely subtruncate, not produced, even in the gentle arcuation seen in *L. albipalpus;* sinistral (prestylar) portion of margin slightly more arcuato-lamellate than the dextral portion; styles simple, acute, tapering, virtually subequal in bulk.

All tarsi lacking in the type except the sinistral cephalic, which show no appreciable inflation of the metatarsus, ventral margin of which in profile is seen to be virtually straight throughout, the very narrow pulvillus covering nearly the entire ventral surface and bordered laterad by the usual spinule series.

General color uniform pitch black, the coxae proximad and mouth-parts very pale zinc orange; palpi pale ochraceous-buff with ultimate article weakly washed with umber. Limb spines deep russet; tarsi paling distad to tawny.

Length of body, 18.5 mm.; length of pronotum, 5.7; greatest width of pronotum, 7.1.

In addition to the type I have before me the male from Venezuela reported by Hebard in 1919 (vide supra). This specimen is in very bad condition, and shows certain features of difference from the Villavicencio male. However, until more definite evidence is available I prefer to consider it *ancistroides*, with which it agrees in general form, palpal features, form of the distal sternite, genital hook and cephalic metatarsus. The distal tergite (supra-anal plate) has the disto-lateral angles acute, and not all rounded as in the type, but as the other features of the tergite are not different in any noteworthy degree, I feel this condition is best considered an individual one, at least until further evidence is available.

Lamproblatta romani[18] new species (Pl. I, fig. 17; pl. II, figs. 6–9.)

This species needs comparison solely with *L. ancistroides*, described above, and from which its more symmetrical, less sinistrally expanded, and mesad marginally more arcuate distal sternite (subgenital plate) of the male will readily distinguish it. The appreciably deplanate distal tergite (supra-anal plate) of the male is another feature of real difference.

This species has the caudal metatarsi decidedly more slender and less broadened than in *L. albipalpus*, with the pulvilli also greatly reduced in size. Possibly *L. ancistroides* shares this same, quite marked difference, but determination of this must await more perfect material of that species.

Type.—♂; Manaos, Amazonas, Brazil. May. (Roman.) [Stockholm Museum.]

Form as in *L. ancistroides* but size distinctly smaller.

Head similar in form to that of the other species. Palpi of slender type; penultimate article markedly infundibuliform, quite slender proximad; antepenultimate article slender, subequal in width; ultimate article securiform, in length slightly shorter than penultimate article (as 9 to 10).

Pronotum, mesonotum and metanotum as in other species.

Abdomen with basic proportions as in *L. ancistroides*, but tergites five to seven have the disto-lateral angles somewhat more acute produced. Distal tergite (supra-anal plate) as in *L.*

[18] Dedicated to Dr. Abraham Roman, of the Department of Entomology of the Stockholm Museum, who collected the type material.

ancistroides but more deplanate, with the medio-longitudinal tectation subobsolete. Genital hook with "heel" produced into a marked though well rounded structure projecting distad. Cerci broken. Distal sternite (subgenital plate) with interstylar portion of distal margin equal in width to two-fifths of entire width of tergite (as 28 to 70); in shape this interstylar portion is broad arcuately produced, sinistral (prestylar) portion of margin with lamellation much reduced and the sinistral and dextral counterparts are nearly equal in shape and in development: styles similar, subequal, tapering, acute, heavier proportionately than in the type of *ancistroides*.

Metatarsi not appreciably inflated or expanded, the caudal showing in profile a regular increase in depth in proximal two-fifths, thence distad the depth is uniform and the ventral margin straight, the whole distinctly slender and elongate, with greatest depth contained six times in the metatarsal length; pulvillus of caudal metatarsus covering the distal three-fifths of the metatarsus, narrow, bordered laterad by spaced fine spinules; caudal metatarsus nearly equal to one and one-half times the combined length of the succeeding tarsal articles: the median and cephalic limbs show metatarsal developments of the same character as described for the caudal limbs, but, in proportion to the general limb size, shorter and stockier.

Allotype.—♀; Lagoa de Poraquequare, near Manaos, Amazonas, Brazil. May 13, 1915. (Roman; in campo.) [Stockholm Museum.]

The following features of the female are those of evident difference from the male.

Size subequal to male of *L. ancistroides*, but from slightly more slender.

Distal abdominal tergite (supra-anal plate) transverse trigonal, greatest exposed median length equal to one-half greatest proximal width of tergite (as 19 to 38); lateral margins nearly straight oblique convergent; apex shallowly but distinctly broad arcuate-emarginate; surface of tergite moderately arcuate in transverse section, without trace of any medio-longitudinal tectation. Cerci half again as long as distal tergite, fusiform, acute distad. Distal sternite (subgenital plate) with valves projecting but moderately distad of distal tergite.

Metatarsi simple, even more slender and unexpanded than in male sex, the caudal subequal in depth for nearly the entire length, and with the greatest depth contained more than eight and one-half times in greatest length (as 4 to 35); pulvilli of all metatarsi apical only, ventral marginal spinules well developed and extending most of distance to base of metatarsus.

General color pitch black, the limbs in part more rufescent—liver brown to hay's russet—either by coxal and tarsal paling (male) or paling of the cephalic femora, tibiae and tarsi and the tarsi of the other limbs (female). Mouth-parts ochraceous-salmon; palpi ochraceous-buff washed with prout's brown, particularly on ultimate article; ocellar spots ochraceous-salmon; eyes mummy brown to piceous. Spines of the limbs madder brown.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum
♂, *type*	15.7	4.8	6
♀, *allotype*	18.3	5.1	6.9

The type and allotype are the only specimens of this species which I have seen.

Lamproblatta meridionalis (Bruner) (Pl. I, fig. 18; pl. II, figs. 10–13.)

1906. *Blatta (Stylopiga) meridionalis* Bruner, Journ. N. Y. Entom. Soc., XIV, p. 141. [♂, ♀; Trinidad.]

I have examined a female of this species in the Hebard Collection ex Bruner, which was taken with the type, and a male labelled "Trinidad, 1924, Miss Cheesman," belonging to the British Museum. The characteristic form of the distal tergite (supra-anal plate) of the male, the generalized male distal sternite (subgenital plate), and the slender, entirely unexpanded caudal metatarsi of the same sex, with small apical pulvilli, are very distinctive features.

The female has the disto-lateral angles of the second to seventh abdominal tergites more produced than in the same sex of *romani*, being very similar to *albipalpus* in this respect, while the distal tergite (supra-anal plate) differs from that of any other female of the genus known to me in its rounded, unemarginate distal margin.

The specimens before me measure (in millimeters) as follows:

	Length of body	Length of pronotum	Greatest width of pronotum
♂	16.3	4.5	5.5[19]
♀	20	5.8	7.3

[19] Abnormally compressed.

The species *meridionalis* appears to be the most generalized member of the genus, probably representing, in the simplicity of the male tarsal structure and the form of the distal tergite and sternite in both sexes, an earlier evolutionary stage in the generic specialization than is evidenced by species such as *zamorensis*, *mimetes*, *albipalpus* and *ancistroides*. The species *romani* in some respects shows an approach toward *meridionalis*.

The Alaris Group of the Genus Pelmatosilpha

This tentatively designated species-group is characterized by possessing tegmina and wings reaching nearly or quite to the apex of the abdomen, the tegmina corneous or subcorneous in texture, with the venation delicately indicated and the anal sulcus finely but distinctly marked in its distal third. Whether this entity is a natural assemblage is, of course, not possible to determine before a comprehensive study of all the forms which have been referred to the genus, has been made. The species here referred to the Alaris Group are *P. alaris* Saussure, *aterrima* (Walker), *rotundata* Scudder, *P. lata* and *guianae* Hebard and *P. macu* and *miranha* new species. Of these *guianae* and *lata* agree in the relatively narrow distal tergite (supra-anal plate) of the male, while *alaris* and *rotundata* have the same tergite broader and more quadrate. The male sexes of *macu* and *miranha* are not known. The cerci of *lata*, *guianae* and *alaris* are, in both sexes, elongate, very distinctly surpassing the distal tergite, while in *rotundata*, *macu* and *miranha* they are but little longer than the same tergite. Walker's *aterrima* has the distal tergite of the male as in *guianae* and *lata*, with the cerci also as in those species, but the head and pronotum are proportionately very much larger, which features at once distinguish the species from the others of the genus known to me.

It is possible that Shelford's *Pelmatosilpha convexa*,[20] from Espirito Santo, Brazil, may be a member of this species-group. It has, however, the "anal vein absent" in the tegmina and has the same appendages appreciably bicolored. Known only from the female, *convexa* is in size similar to *P. macu*, here described. I have not recognized the species in available collections, and at this writing am unable to do more than call attention to it.

[20] Genera Insectorum, fasc. 109, Orth., Blatt., Blattinae, p. 13, footnote, (1910).

In a linear arrangement I would, at least provisionally, place the species of the group in the sequence in which they are here discussed. However, when we are acquainted with the male sex of *P. macu* and of *P. miranha*, here described from females, it may be necessary to modify the arrangement of the species.

Pelmatosilpha rotundata Scudder (Pl. II, fig. 14; pl. III, fig. 1.)

1900. *Pelmatosilpha rotundata* Scudder, Proc. Davenport Acad. Nat. Sci., VIII, p. 93, pl. 2, fig. 5. [♂, ♀: Texas, (type) [21]: Panama.]

COSTA RICA: no exact locality. One male. [A. N. S. P.]

This specimen fully agrees with Scudder's description, and I am figuring the distal tergite (supra-anal plate), cerci and apex of the genital hook. The distal sternite (subgenital plate) has been damaged in the present individual. In size the latter agrees almost exactly with Scudder's measurements.

Caudell [22] and Hebard [23] have reported the species from Porto Bello, Panama. The specimen reported by me in 1906 [24] as a female of *P. rotundata* from the Reventazon River, Plains of Santa Clara, Costa Rica, is not a member of this genus and is being discussed elsewhere.[25]

Pelmatosilpha macu [26] new species (Pl. III, figs. 2 and 3.)

Closely related to *P. rotundata* Scudder, from Panama, but differing in its smaller size (body length, ♀, 19.5 mm.), smoother tegmina, the distal extremity of which is more subtruncate and less broadly rounded, in the more numerous (13–14 instead of 9) spines (including distals) on the ventro-cephalic margin of the cephalic femora, and in the rufescent instead of blackish head and limbs. The features of difference from *P. miranha* new species, are given below under the latter form.

Type.— ♀; Manaos, Amazonas, Brazil. May 12. (Roman.) [Stockholm Museum.]

[21] This specimen has been indicated as the type by Hebard (Mem. Amer. Entom. Soc., 2, p. 267, (1917)), and I fully agree with his conclusion that it almost certainly was an accidental introduction from Central America.

[22] Insec. Inscit. Menst., II, p. 79, (1914).

[23] Mem. Amer. Entom. Soc., 4, p. 101, (1920).

[24] Proc. Acad. Nat. Sci. Phila., 1905, p. 792, (1906).

[25] See page 55.

[26] After the Macu aboriginal stock of the Rio Negro region.

Size small (for group); form and texture as in the related species; surface of head, pronotum, tegmina, abdomen and limbs moderately polished.

Head broad, greatest width across eyes equal to the greatest depth of head; face subdeplanate; occipital outline as seen in cephalic aspect regularly arcuate, occipital interspace between eyes slightly greater than the interspace between internal borders of antennal scrobes (as 26 to 22); palpi relatively short, ultimate and penultimate articles subequal in length, the latter strongly infundibuliform and markedly tapering proximad; ultimate article subsecuriform in profile, somewhat broadened in extensor aspect; antepenultimate article longer than penultimate (as 13 to 11).

Pronotum of the form and character found in related species, greatest width slightly less than one and one-half times the greatest length of pronotum.

Tegmina reaching caudad to the middle of the antepenultimate abdominal tergite, relatively broad, greatest width contained but twice in the greatest tegminal length; costal margin as a whole gently arcuate but slightly flattened disto-mesad, rather sharply rounding to the truncato-arcuate distal margin, which on the sutural side rounds more broadly to the straight sutural margin; anal field reaching very faintly distad of middle of tegmen, anal sulcus distinctly indicated in distal third. Wings reaching to tegminal apices when the alar organs are in repose.

Distal abdominal tergite (supra-anal plate) roughly trigonal in outline with distal margin mesad broadly and rather shallowly triangularly emarginate, greatest exposed length of tergite subequal to half greatest proximal width of same; lateral margins of tergite shallowly concave about cercal bases, thence nearly straight oblique convergent for a distance, and finally gently arcuate to the rounded rectangulate disto-lateral angles; width of tergite at distal extremity less than a third the proximal width of the tergite (as 15 to 50); surface of tergite very faintly and roundly tectate medio-longitudinally, laterad of this elevation concavely subexcavate, particularly proximad. Cerci slightly longer than greatest length of distal tergite (as 30 to 25), projecting distad of same a distance equal to one-third of the cercal length; in form the cerci are broad fusiform, regularly tapering in distal half, deplanate dorsad. Distal abdominal sternite (subgenital plate) with valves falling slightly short of apex of distal tergite.

Cephalic femora with eleven well-spaced spines on ventro-cephalic margin in addition to distal pair. Caudal tibiae relatively stout but not expanded. Caudal metatarsi but slightly more than half as long as the succeeding articles combined (as 19 to 35), pulvillus occupying one-fourth of length of metatarsus; pulvilli large on tarsal articles two to four.

General color bay, paling to tawny on the normally covered portion of the right tegmen, and becoming deep prout's brown on distal two-thirds of abdomen. Wings tawny. Head and limbs vinaceous-rufous to brick red, the ventral portion of face brazil red; antennae orange-rufous; eyes mummy brown; ocellar spots and clypeus dull antimony yellow.

Length of body, 19.5 mm.; length of pronotum, 5.5; greatest width of pronotum, 8.5; length of tegmen, 13.7; greatest width of tegmen, 6.9.

The type of this species is unique.

Pelmatosilpha miranha[27] new species (Pl. III, figs. 4 and 5.)

This is the smallest fully alate species of the genus known. It is closely related to *P. macu*, described above, but differs in its appreciably smaller size (length of body of female, 17 mm.), in the more compressed, subrostrate distal abdominal tergite (supra-anal plate) of the female, which is strongly vaulted with its apex deeply arcuate-excavate (instead of broadly trigonal-emarginate), in the cerci being broader, stockier and less tapering in distal half, and in the dull, more uniformly subpiceous color of much of the exposed dorsal surface.

Type.— ♀ ; Rio Igaraparana,[28] Oriente, Peru. August 14-17, 1920. (Cornell University Exped.) [Academy of Natural Sciences of Philadelphia, Type no. 5480.]

Size very small (for genus); form as in *P. macu.*

Head as in *P. macu.*

Pronotum in general as in *P. macu*, but cephalic and lateral margins more regularly and broadly rounded as seen in dorsal aspect.

Tegmina of the type usual in the group, reaching caudad to the distal margin of the antepenultimate abdominal tergite, in shape essentially as in *P. macu*, greatest width contained faintly less than twice in the greatest tegminal length; costal margin with the disto-median flattening much more evident than in *P. macu:* distal margin as in *macu.*

Distal abdominal tergite (supra-anal plate) markedly trigonal, much more narrowly so than in *macu*, subrostrate, in transverse section distinctly elevated medio-longitudinally and vaulted, although without a distinct carina at highest point; greatest exposed length of tergite subequal to half greatest proximal width of same, width of tergite at distal extremity equal to one-fifth

[27] After the Miranha aborigines of the Putumayo region.

[28] This is the most important tributary of the Rio Putumayo or Rio Içá, entering this stream from the left at about 71° 30′ W.

of proximal width of tergite (as 8 to 40); lateral margins of tergite shaped as in *macu*, but distal margin of same is narrowly but sharply and deeply arcuate-emarginate when seen from dorsum, which concavity as seen in caudal aspect is subquadrate; caudolateral angles very narrowly rounded; surface of tergite distinctly impressed longitudinally on each side between cercal insertion and median tectation, this pronounced proximad and reaching for some distance distad thence intermarginally. Cerci slightly longer than greatest length of distal tergite (as 25 to 20), projecting distad of same a distance equal to one-fourth of cercal length; in form the cerci are very broad fusiform, evenly shaped and not at all tapering distad, the apex briefly acute; dorsal surface of cerci deplanate. Distal abdominal sternite (subgenital plate) with valves reaching to apex of distal tergite.

Cephalic femora spined as in *P. macu*.[29] Caudal tibiae weakly inflated, more appreciably expanded than in *macu*. Caudal metatarsi and pulvilli of caudal tarsi as in *P. macu*.

General color above very dull and dark maroon, virtually piceous on the tegmina and dorsum of the abdomen, becoming dull bay on the pronotum. Ventral surface largely dull zinc orange, much of the face with a large blotch of russet, a mediolongitudinal cloud on the venter of the abdomen mars brown, paling laterad. Caudal tibiae and tarsi, and weakly the median, washed with russet; limb spines deep russet. Antennae dull zinc orange. Eyes blackish bister. Ocellar spots and palpi ochraceous-buff, the ultimate article of the palpi washed with zinc orange and narrowly clouded distad with prout's brown. Cerci and distal abdominal tergite bay, the cerci very narrowly tipped with blackish.

Length of body, 17 mm.; length of pronotum, 5.3; greatest width of pronotum, 6.9;[30] length of tegmen, 11.5; greatest width of tegmen, 6.

The type of this diminutive species is unique.

Pelmatosilpha alaris (Saussure)

1864. *Peripl[aneta] alaris* Saussure, Revue et Magasin de Zoologie, 2e ser. XVI, p. 319. [♂; Brazil.]

I have seen no material referable to this species, which in size more nearly agrees with *P. guianae* than with any other before me, while the proportionate length of the cerci are as in that species and in *P. lata*. The form of the distal sternite (supra-anal plate) of the male in *alaris*, however, associates it with *rotundata*, and not with *guianae* and *lata*. Saussure, subsequent to the original

[29] On one limb but seven ventro-cephalic marginal spines are present, on the other the usual eleven.

[30] Estimated width, dextral side injured.

description, gave a much more complete description and a good figure of the species.[31]

The head of *alaris* bears a transverse testaceous vitta, and the cephalic margin of the pronotum is said to be similarly colored.

Pelmatosilpha guianae Hebard

1926. *Pelmatosilpha guianae* Hebard, Proc. Acad. Nat. Sci. Phila., LXXVIII, p. 191, pl. 15, fig. 14. [♂; St. Jean du Maroni, French Guiana.]

BRAZIL: Rio Autaz, Amazonas. September. (Roman; taken from under bark of tree.) One male. [Stockholm Museum.]

This specimen has been compared with Hebard's type and the two clearly represent the same species. The Rio Autaz individual is of a more recessive phase of coloration than the St. Jean du Maroni type, having on the dorsal and ventral surfaces of the abdomen regularly placed lateral series of juxta-marginal orange-ochraceous spots, one on each segment except the two distal sternites and the three distal tergites, which lack clearly defined markings. The distal tergite (supra-anal plate) and sternite (subgenital plate) are more rufescent than the general abdominal tone, while the piceous of the pronotum, tegmina and limbs is lighter and clearer than in the type. In size the Rio Autaz specimen is almost identical with the type.

Pelmatosilpha lata Hebard

1929. *Pelmatosilpha lata* Hebard, Trans. Amer. Entom. Soc., LV, p. 361, pl. 14, figs. 1 and 2. [♂, ♀; Kartabo (type locality), Kaiteur, Tumatumari and Demerara, British Guiana.]

I have examined the original series of this very striking species, which looks much like a very large edition of *P. guianae*, but has marked differences in the shape and sculpture of the distal tergite (supra-anal plate) of the male, and in the shape of the distal margin of the tegmina.

Pelmatosilpha aterrima (Walker) (Pl. III, figs. 6–9.)

1869. *Periplaneta aterrima* Walker, Catal. Derm. Salt. and Suppl. Blatt., p. 151. [♂; Peru.]

1887. *Pelmatosilpha praestans* Dohrn, Stettin Entom. Zeit., XLVIII, p. 411. [♂, ♀; "In confiniis Peruviae et Brasiliae (Fonteboa)," i.e. Fonteboa, Amazonas, Brazil.]

[31] Mém. Hist. Nat. Mexiq., III, p. 75, pl. 1, fig. 10, (1864), [♂].

ECUADOR: Canelos, Oriente.[32] One male. [A. N. S. P.]

This robust species of large size differs from the others of this group chiefly in the proportionately heavier head and pronotum. The head is subcircular in cephalic aspect, the greatest width across the eyes being subequal to the greatest depth of the head, while the occipital interspace between the eyes is very broad, very faintly wider than the interspace between the internal margins of the antennal scrobes, and the occipital outline, as seen in cephalic aspect, is markedly arcuate, appreciably marked off from the curvature of the eyes as seen in the same aspect. The pronotum is heavy, subhexagonal, greatest width approximately caudad of the middle, and subequal to greatest width of abdomen; in transverse section the pronotum as a whole is regularly arcuate. The distal abdominal tergite (supra-anal plate) is, with the cerci and adjacent abdominal tergites as originally described, markedly hirsute, the hairs on the distal tergite depressed or subdepressed; in form the distal tergite is mesad produced trigonal, the greatest median length contained one and two-thirds times in greatest proximal width of tergite, lateral margins regularly converging distad from supra-cercal emarginations, distal margin deeply V-emarginate with its lateral angles well rounded; in transverse section the distal tergite is low tectate, with a weak mediolongitudinal carination. Cerci one and two-thirds times as long as median length of distal tergite, surpassing apex of same by faintly more than half the cercal length, lanceolate, acute distad, there faintly incurved, dorsal surface deplanate. Distal abdominal sternite (subgenital plate) transverse; interstylar section of margin somewhat produced, its short lateral borders straight convergent, weakly thickened and rounding to the very shallowly obtuse-angulate median emargination; surface of distal sternite shallowly biconcave.

The caudal tibiae of the male sex of *praestans* are heavy, appreciably inflated in lateral aspect, the marginal spines all distinctly arcuate distad.

[32] This locality is at the head of the Rio Bobonaza, a tributary of the Rio Pastaza, about 25 kilometers upstream from the better known locality of Sara-yacu. The approximate position of Canelos is 80° W, 1° 35′ S. This specimen was recorded by Hebard in 1924 as *P. praestans* (Proc. Acad. Nat. Sci. Phila., 1924, p. 125).

The specimen in hand measures as follows: length of body, 40.5 mm.; greatest width of head, 9.2; length of pronotum, 12.3; greatest width of pronotum, 17; length of tegmen, 31.5; greatest width of tegmen, 15.3. It will be seen that the Canelos individual is appreciably larger than Dohrn's male type.

The synonym given above was established in 1913 in a posthumous paper of Shelford.[33] In 1907, some years previous, the latter had examined Walker's type of *aterrima*,[34] and he was therefore familiar with that author's species.

With Shelford's 1913 record of the species from Santo Domingo de los Colorados, Pichincha, Ecuador, the records given above present our entire knowledge of the species.

Two New West Indian Species of Eurycotis

Eurycotis lixa[35] new species (Pl. IV, figs. 1–9.)

A near relative of the Hispaniolan *E. tibialis* Hebard,[36] agreeing in its general structure, marked tibial dilation in the male sex, and in the general coloration, but differing in the less extreme tibial dilation of the male, in the female sex having the caudal tibiae with subparallel margins and no trace of the pinched dilation seen in that sex of *tibialis*, in the more slender tarsi, the less conical and more lanceolate tegmina in both sexes, in the median emargination of the margin of the ultimate tergite (supra-anal plate) of the abdomen being obtuse-angulate, in the shorter, broader, less acute and more lanceolate cerci of the female, and in the narrower distal emargination of the ultimate abdominal tergite (supra-anal plate) of the same sex.

The only known male of *tibialis*, the type, is not now available, but the female specimen taken as an adventive at Orono, Maine, and listed by Hebard in the original description, is before me. Doubtless an actual comparison of male material will show additional features of differential diagnostic value. The species are clearly of similar origin, but abundantly distinct.

[33] Miss. Serv. Geogr. pour la mesure Arc de Merid. Equat., 1899–1906, x, fasc. 4, p. 58, (1913).

[34] Trans. Entom. Soc. London, 1906, p. 501, (1907).

[35] From *lixa*, a sutler or camp follower.

[36] Entom. News, xxvii, p. 264, pl. 14, fig. 1 and text fig., (1916). [♂, ♀; San Francisco Mountains, Dominican Republic; "San Domingo."]

Type.—♂; Taken at New York City on banana ship from Jamaica. October 20, 1924. (F. M. Schott.) [Hebard Collection, Type no. 1161.]

Size above average for genus: general form elliptical; surface as a whole moderately polished.

Head broad cordiform, faintly deeper than greatest width across eyes; interocular width of occiput very great, equal to one and two-fifth times that between internal margins of antennal scrobes (as 45 to 32); outline of occiput and eyes as seen in cephalic aspect regularly and strongly arcuate; face subdeplanate ventrad.

Pronotum of type usual in genus, greatest length contained one and one-third times in greatest caudal width of same: cephalic margin relatively narrow, moderately arcuate, regularly passing laterad into the oblique, caudad well arcuate, lateral margins; caudal margin transversely truncate; caudo-lateral angles very narrowly rounded.

Tegmina lateral, acute sublanceolate, but faintly surpassing distal margin of mesonotum; greatest length slightly less than one and one-half times greatest (faintly premedian) width: costal margin nearly straight except for a brief proximal arcuation and a similar arcuation distad to the narrowly acute apex; sutural margin as a whole arcuate, but appreciably oblique arcuato-truncate from point of greatest width (slightly proximad of middle) to distal fourth; surface finely rugulose.

Abdomen with caudo-lateral angles of tergites acute-produced, but less spiniform than in *E. tibialis;* dorsum of abdomen distinctly deplanate. Ultimate tergite (supra-anal plate) transverse, broad subtrigonal, lateral portions of distal margin converging subsigmoid, mesad the margin is broadly and shallowly obtuse-emarginate, passing laterad over broadly rounded paired lobations into the oblique lateral portions of the margin; surface of plate moderately impressed intermarginally. Cerci damaged. Ultimate sternite (subgenital plate) transverse, greatest proximal width slightly more than twice as great as median length; extra-stylar lateral sections of margin of sternite converging subarcuate, stylar depressions marked, interstylar portion of margin broadly bilobate with a very shallow median emargination, the lobations broader, lower and more evenly arcuate, and the emargination less decided than in the case with the distal margin of the ultimate tergite; styles elongate, simple, as a whole regularly tapering, very acute distad.

Limbs robust, compressed. Cephalic femora with spines of ventro-cephalic margin heavy and regularly spaced, the two distal decidedly larger than the others, the third of this series from distal extremity distinctly shorter than distal pair but slightly longer than the major part of the series. Median and caudal femora stout: caudal tibiae decidedly inflated by expansion of flexor and

extensor surfaces, markedly fusiform in cephalic and caudal aspects, these surfaces each with a depressed longitudinal subfusiform area, which may be medio-longitudinal or nearer the extensor surface, which latter is narrowed although bearing the usual triple series of spines. Caudal tarsi moderately compressed, metatarsus shorter than remaining joints united, as 38 to 50, its ventral surface not inflated but biseriately spinulose as usual in genus.

Allotype.—♀ ; same data as type. [Hebard Collection.]

Differing from the above description of the male sex in the following noteworthy features.

Size larger.

Pronotum with greatest length contained one and two-fifth times in greatest caudal width of same.

Tegmina as in male but costal margin more evenly arcuate throughout and apex less sharply acute.

Dorsum of abdomen as usual more convex. Ultimate tergite (supra-anal plate) slightly transverse, trigonal-produced, greatest proximal width nearly two and seven-tenth times the greatest median length of the same, instead of less than twice the same as in *E. tibialis*, median emargination of distal margin broadly U-shaped, proportionately shallow, lateral borders of the emargination diverging distad to the very narrowly rounded rectangulate junctions with the arcuate disto-lateral margins of the tergite; surface of the tergite shallowly tectate in transverse section. Antepenultimate tergite (the visible penultimate limited in normal position to short lateral sections) with its distal margin broadly and markedly convex between supra-cercal regions, mesad with the faintest possible emargination, the tergite mesad markedly longer than in *E. tibialis*. Cerci broad lanceolate, not at all elongate acuminate at apex, but faintly surpassing apex of ultimate tergite, greatest width of cercus contained three times in greatest length, instead of three and one-half times as in *E. tibialis*. Ultimate sternite (subgenital plate) in ventral view with lateral margins of valves forming a rectangulation, instead of an obtuse angle as in *E. tibialis;* in profile distal and ventral outline of valves regularly arcuate.

Caudal tibiae moderately robust but not fusiform dilated as in male, the width subequal and flexor and extensor surfaces subparallel in distal two-thirds, no indication of depression of the cephalic and caudal surfaces; extensor surface as a whole somewhat broader than in male.

General color pitch black, in the male showing a maroon tinge at certain angles; tibial and femoral spines deep maroon. Eyes mummy brown (male) to pitch black (female); ocellar spots pale yellow.

Measurements (in millimeters)

	Length of body	Interocular width	Length of pronotum	Greatest width of pronotum
♂, *type*	26.2	3.8	8.3	12
♀, *allotype*	33	3.8	9.5	13

	Length (costal) of tegmen	Greatest exposed width of tegmen	Length of caudal tibia	Length of caudal tarsus
♂, *type*	5.1	2.7	10	7.4
♀, *allotype*	5.7	2.9	10.7	7.6

The type and allotype are the only specimens of this striking species I have seen. It is quite reasonable to suppose its native home is Jamaica, and that it is in that island the complement of the Hispaniolan *E. tibialis.*

Eurycotis improcera [37] new species (Pl. IV, figs. 10–12; pl. V, fig. 4.)

A close relative of *E. similis* Caudell, from Antigua,[38] but immediately separable by its distinctly smaller size, squarely quadrate tegmina, which also have the anal field abbreviate and transverse, the anal sulcus joining the sutural margin hardly distad of the middle of the latter, by the interstylar portion of the distal margin of the ultimate sternite (subgenital plate) of the male being transversely truncato-arcuate, by certain differences of the concealed genitalia, and by features of the coloration, as the more extensive blackish spectacle-like pronotal marking, the broad dark markings proximad on the discoidal and anal fields of the tegmina, the complete dorsal and ventral lateral pale borders of the abdomen, and the paler caudal tibiae and metatarsi, both of which are dark annulate distad, thus agreeing with the color of the immediately succeeding tarsal joints.

When compared with the Trinidadian *E. decipiens* (Kirby), which is the third member of the species group to which *improcera* belongs, the latter can at once be distinguished by the form of the distal margin of the ultimate sternite (subgenital plate) of the male, by appreciable differences in the form of the ultimate tergite (supra-anal plate) of the same sex, as well as the sectionally less expanded caudal tibiae, and by details of the coloration of the head, pronotum, tegmina, abdomen and limbs.

[37] From *improcerus*, of small stature.

[38] Univ. of Iowa Studies in Nat. Hist., x, p. 22, fig. 1, (1922). [♂, ♀; Antigua.]

In the general outline of the tegmina *improcera* more nearly resembles *decipiens* than it does *similis*, but in the caudal tibial form and the basic features of the color pattern the new species is far more intimately aligned with the geographically nearer *E. similis*. The proportions of the anal field of the tegmina and the curve and unusual point of junction of the anal vein of the same are features peculiar to *improcera*, not shared with the allied species.

Type.—♂; Prosperity, near Cane Bay, St. Croix, Virgin Islands. February 27, 1925. (F. E. Lutz; in wooded cover.) [American Museum of Natural History.]

Size small (when compared with *E. similis* and *decipiens*); form and general appearance as in related species.

Head broad cordiform, greatest depth but faintly greater than greatest width across eyes: interocular portion of occiput very broad, distinctly wider than space between internal margins of antennal scrobes (as 28 to 22); curve of occiput and eyes regular and continuous. Palpi of medium build; ultimate and penultimate articles of equal length, the former infundibuliform; antepenultimate article one and two-fifth times as long as penultimate (as 15 to 11).

Pronotum of same character and proportions as in the related species; cephalic margin less truncate, more truncato-arcuate; caudal margin truncate, becoming sub-obliquely arcuate as the caudo-lateral angles are approached, as in the same sex of *E. decipiens*.

Tegmina quadrate, faintly broader than costal length, reaching to the lateral bases of the third abdominal tergite: costal margin faintly arcuate, sharply rounding over the disto-costal angle; sutural margin similarly arcuate and more narrowly rounding over the disto-sutural angle; distal margin transversely subtruncate: venation and fields as a whole but obscurely indicated, and then mainly by the intercalated areolate pattern; anal field well defined by the deeply impressed distal half of the anal sulcus, which is transversely oblique in its trend, joining the sutural margin at the middle of its length, and forming an anal area, the greatest width of which is but three-fifths the greatest (oblique) length of the same.

Abdomen relatively broad, appreciably exceeding the pronotal width, general structure as in *E. decipiens*. Ultimate tergite (supra-anal plate) transverse, lateral margins converging concave to relatively broad bilobations, which are separated by an obtuse-angulate median emargination, broader and more open than that of *E. decipiens*, marginal hairs fewer than in the

latter species. Cerci in form and proportions as in *E. decipiens*. Ultimate sternite (subgenital plate) transverse, greatest normally exposed length but one-third of greatest proximal width; lateral sections of margin to stylar fossae brief, oblique subarcuate; stylar fossae relatively deep, concave; interstylar portion of margin but moderately produced, arcuate laterad, passing into a broadly and shallowly subconcave median section: styles elongate, styliform, acute, appreciably arcuate.

Concealed genitalia: sinistral hook much as figured by Caudell [39] for *E. similis* but the bend of the shaft is more evenly curved and the extremity is more obliquely docked; sinistral whip-like appendage (figure 1e of Caudell) proportionately longer, more filiform and more curved; as the type is unique dissection for additional concealed features is unwarranted.

Limbs robust, femoral and tibial spination heavy: caudal femora distinctly enlarged, stocky: caudal tibiae appreciably fusiform in cephalic and caudal aspects, the proximal portion more slender than the distal; in extensor aspect the femur is seen to be of moderate and uniform thickness, not compressed in any portion of its length. Caudal tibiae with the more distal articles together appreciably longer than the metatarsus (as 32 to 27), in profile the metatarsus moderately but regularly enlarging distad, ventral biseriate spines marked.

General color of head, pronotum, tegmina and limbs cinnamon-buff with a pinkish tinge mesad on the pronotum; general tone of abdomen (both discal surfaces) and head, pronotal, tegminal and limb maculations pitch black, on the abdomen with a maroon tinge in certain lights. Head with a broad interocular dark bar on the frons, mesad this extending ventrad in a rectangulate extension between the eyes; clypeus, labrum and adjacent lower face infuscate; eyes mummy brown to pitch black; antennae pale zinc orange becoming tawny proximad; palpi of the general color. Pronotum with a dark pattern composed of a pair of cephalad converging and narrowly connected elongate-elliptical markings, forming a spectacle-shaped figure; caudal margin between points dorsad of tegminal articulations bordered with dark, enlarged at the lateral extremities but not connected with the main dark marking of the pronotal disk; lateral and cephalic margins of the pronotum pencilled with dark, finely so cephalad. Tegmina with that section of the paired tegmina subjacent to the dark caudal section of the pronotum similarly but more broadly dark, laterad extending distad some distance in the general situation of the humeral trunk, and in an attenuating degree along the sutural margin to and beyond the junction of the anal sulcus; impressed section of anal sulcus lined distad with dark. Abdomen on both surfaces with broad subequal lateral apricot orange

[39] Vide supra, p. 24, fig. 1a.

borders reaching distad to cercal bases. Narrow lining of ventral margins of femora, a narrow dorsal medio-longitudinal clouding of same, proximal and distal annulations of the tibiae, a distal banding of the metatarsi and distal tarsal article and general clouding of the other tarsal articles, dark; femoral and tibial spines chestnut-brown.

Length of body, 18 mm.; interocular width, 2.3; length of pronotum, 5.9; greatest width of pronotum, 7.9; length of tegmen, 5.4; greatest width of tegmen, 5.5; length of caudal tibia, 6.2; length of caudal tarsus, 4.9.

In addition to the type I have before me a female individual in the instar preceding maturity, which bears the same data as the type. I have not drawn upon it for morphological characters on account of its immature condition. In coloration it agrees with the type, except that the dark color of the abdominal disk extends cephalad over the metanotum and mesonotum and the pronotal disk solidly, except for weak maroon tendencies mesad on the metanotum and mesonotum, and a subochraceous area on the pronotum in the place of the pale area caudad on the disk in the type. As in the immature condition of other species of the genus the lateral pale borders are continuous from the pronotum to the abdomen.

The differentiation of *Eurycotis* and *Pelmatosilpha* remains as uncertain as it was in 1927.[40] The genotypes of *Eurycotis* and *Pelmatosilpha* are quite distinct, as stated by Rehn and Hebard, but only by a comprehensive study of the species which have been referred to both genera will their true generic associations be determined. This treatment is not possible at this time, and for the present I prefer to use the generic names as applied by Rehn and Hebard in 1927.

Nyctiborinae

The Genus Muzoa Hebard

The genus *Muzoa* was erected in 1921 by Hebard[41] for a species of nyctiborid, which at first glance appears far less different from forms of the genus *Nyctibora* than more extensive examination shows to be the case. The original species was described from Muzo, Boyacá, Colombia, and, with a single exception, our

[40] See Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., LIV, p. 147, (1927).
[41] Trans. Amer. Entom. Soc., XLVII, p. 131, pl. 9, figs. 20 and 21, (1921).

knowledge of the genus in past literature is limited to the description of the genus and the genotype. The exception is that, years ago in 1905, I reported a female blattid from the Reventazon River, Plains of Santa Clara, Costa Rica, as *Pelmatosilpha rotundata* Scudder.[42] At that time *Pelmatosilpha rotundata* was known to me solely from the literature, and the specimen in question, which is now before me, proves to represent a new species of the genus *Muzoa*. In recent years I have personally taken both sexes of the Costa Rican *Muzoa*, which is here described.

The symmetrical tarsal claws of *Muzoa* will at once distinguish that genus from *Nyctibora*, while there is a general but fine punctulose surface texture of the body and tegmina, beneath the sparse and very short vesture, which is different from the condition found in *Nyctibora*. Hebard's generic description sums up the salient features of the genus.

Muzoa simplex Hebard

1921. *Muzoa simplex* Hebard, Trans. Amer. Entom. Soc., XLVII, p. 132, pl. 9, figs. 20 and 21. [♂; Muzo, Boyacá, Colombia.]

Hebard's type is now before me, as well as the immature individuals from Villavicencio, Intendencia del Meta, Colombia, recorded by him at the time of the original description.

Muzoa madida[43] new species (Pl. II, figs. 15–17; pl. III, figs. 10 and 11.)

When compared with the male of *M. simplex* that sex of the present species is seen to differ in its appreciably smaller size, its deeper and more slenderly cordiform head, proportionately narrower, more lanceolate and distally less subtruncate tegmina, more strongly arcuate produced interstylar portion of the distal margin of the distal abdominal sternite (subgenital plate), and the more tapering, less robust, styles of the same. As the female sex of *M. simplex* is not known comparison is not possible.

Type.—♂; Near La Emilia, Guápiles District, Costa Rica. Elevation about 1000 feet. September 15, 1927. (Rehn; under dead wood in dense second-growth forest.) [Academy of Natural Sciences of Philadelphia. Type no. 5481.]

[42] Proc. Acad. Nat. Sci. Phila., 1905, p. 792, (1905).

[43] From *madidus*, i.e. wet, soaked, drenched, in allusion to its rain-forest habitat.

Form and shape as in *M. simplex;* size distinctly less than that of the same sex of *simplex;* texture of pronotum and tegmina more coarsely impresso-punctulose, producing a finely cribrose effect.

Head rather narrowly cordiform in cephalic aspect, greatest width across eyes distinctly less than greatest depth of head, the ratio being 9 to 11; lateral margins of genae, as seen in cephalic aspect, nearly straight convergent ventrad; entire buccal region distinctly smaller proportionately than in *M. simplex;* frons between occiput and ocelli subdeplanate; occipital interspace between eyes hardly more than half as wide as that between internal margins of antennal scrobes (as 12 to 23); eyes not at all prominent. Palpi with ultimate article slightly longer than the antepenultimate, robust securiform; penultimate article three-fourths as long as ultimate article, slightly longer than antepenultimate, infundibuliform.

Pronotum of same shape as in *M. simplex.*

Tegmina with its greatest width contained nearly two and one-half times in its greatest length, long margins parallel and width subequal in median half; costal margin distinctly arcuate proximad, and in distal fourth less sharply rounding to the apex than in *M. simplex,* the apex much more narrowly rounded and slightly nearer costal than sutural margin, latter in distal fourth rounding to apex like the costal margin, elsewhere nearly straight: marginal field relatively broad, reaching but briefly distad of apex of anal field; scapular field somewhat more definite than in *M. simplex;* anal field broad pyriform, its greatest width, as in *M. simplex,* at the middle of its greatest length: discoidal sectors and axillary veins of the anal field as in *M. simplex,* but somewhat more pronounced. Wings as in *M. simplex* but with anterior field proportionately narrow, its greatest width contained about two and one-third times in greatest length of same, instead of but little more than twice as in *M. simplex;* apex of anterior field agreeing with apex of tegmina in its arcuation, which is more strongly and less broadly arcuate than in *M. simplex:* costal veins where springing from discoidal vein seven in number, of these three being bifurcate, and several of the rami are again divided, making fourteen at the margin; medio-discoidal and medio-ulnar areas subequal in width; ulnar vein quinque-ramose, several rami being bifurcate.

Abdomen with distal tergite (supra-anal plate) moderately transverse, its free margin arcuate with a weak median emargination, much less pronounced than that of *M. simplex;* distal sternite (subgenital plate) with interstylar portion of free margin markedly produced arcuate, much more prominent than in *M. simplex;* styles simple, tapering, more elongate and more slender than in *simplex:* cerci of the type found in *M. simplex* but

proportionately longer and narrower, their greatest width contained two and one-half times in greatest length, more tapering in outline.

Limb as in *M. simplex*, but somewhat more slender, particularly the femora.[44]

Allotype.— ♀ ; same locality as type. September 13, 1927. (Rehn; shaken from a thick mat of hanging dead vegetation in dense primaeval forest.) [Academy of Natural Sciences of Philadelphia.]

Differing from the description of the male sex in the following noteworthy features.

Size larger, but in some features not equal to male of *simplex*.

Head somewhat broader than in male, the ratio of greatest width across eyes to greatest depth of head being 53 to 58; occipital interspace between eyes nearly two-thirds as wide as that between internal margins of antennal scrobes (as 16 to 25).

Tegmina with its greatest width contained two and one-fifth times in its greatest length; venation and fields as in male.

Abdomen broadly deplanate dorsad as in male. Distal tergite (supra-anal plate) moderately transverse, symmetrically subtrapezoidal, distal margin moderately bilobate with a shallow median emargination. Distal sternite (subgenital plate) large, moderately transverse, as a whole moderately convex ventrad in transverse section; distal margin obtuse-angulate emarginate on each side laterad of the cerci, intercercally the margin being bent dorsad and tucked inward, dorso-cephalad, producing a groove-like emargination as seen in caudal elevation.[45] Cerci as in male.

General color deep fuscous-brown, showing clear pitch brown or maroon on thin chitin as the tegmina, the vesture pale golden. Pronotum faintly maroon in certain areas. Eyes chestnut to

[44] The more proximal and shortest of the three distal spines on the ventro-cephalic margin of the cephalic femora described in *M. simplex* and seen in that type, is generally obsolete in *M. madida*, but one of the three specimens of the species showing any indication of it. The other spines of the same group are typically developed.

[45] This condition is in the allotype only, and is probably due to contraction or a paroxysmal flexing of the sternite, as the paratypic female is quite different in this respect. The latter specimen, however, shows an opposite extreme, the anal orifice being open and inflated, the distal sternite widely separated from the distal tergite, and the distal margin of the former is straight oblique from the lateral emarginations to a median obtusely-arcuate section, the ventral surface of which is somewhat flexed dorsad, and which in the allotype is probably infolded thus producing the groove-like emargination described.

blackish. Ocellar spots, clypeus and, less markedly, the labrum, ochraceous-buff. Most of the anterior field of wing and narrow costal section of posterior field washed with dresden brown, veins of posterior field pencilled in a darker tone, anterior field darkening distad and heavily infuscate distad along the costal border. Limbs showing much dark maroon on coxae, trochanters and femora, tibial spines madder brown to brick red; distal tarsal joint dull zinc orange, somewhat infuscate distad, tarsal claws and arolia zinc orange, the former infuscate toward apices.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest width of pronotum	Length of tegmen	Greatest width of tegmen
♂, *type*	19.2	6.3	9	16	6.9
♀, *allotype*	22	.7	10.4	17.5	8
♀, *paratype*	24.3	8	11.5	18.2	8.3

In addition to the type and allotype I have before me the female specimen in the Academy collection previously recorded as *Pelmatosilpha rotundata* (vide supra). This specimen I am considering a paratype. It was taken by Prof. Pablo Biolley in December, 1904, along the Reventazon in the Santa Clara Plains, at 200 meters elevation, from under leaves in forest. This specimen is larger than the allotype, but shows no noteworthy differences which have not been touched upon above.

The type was taken in a very dense second growth forest where the leaf canopy was heavy and the natural thinning out process of the growing forest had not as yet opened the usual aisles of the mature forest. The allotype was taken several miles distant in mature heavy forest which carried great masses of hanging vines and other creepers, although but few lianes. These suspended canopies often supported mats of rotting vegetation and leaf mould, oozing water from the frequent drenchings of the rainy season, and one of these humus laden tangles held, among other things, the female of *Muzoa* here described as the allotype. In both cases I recognized the genus at once, but exhaustive search failed to reveal any other individuals. In my opinion *Muzoa* is local and uncommon, and I doubt very much whether it is ever as numerous as *Nyctibora* is at times.

EPILAMPRINAE

A New Genus Apparently Related to Pinaconota

In 1912 a bromeliadicolous blattid from Trinidad was described as *Homalopteryx scotti*, in a posthumous note by Shelford contained in an article by Hugh Scott on bromeliad-inhabiting animals.[46] I now have before me a topotypic female of this species, taken on Mt. Tucuché, Trinidad, at an elevation of 2000–3000 feet, January 17, 1924, by Dr. S. A. Neave, and belonging to the Hebard Collection, received in exchange with the British Museum. The most cursory examination shows at once the species is not at all related to *Homalopteryx*, as properly represented by the genotype *H. capucina* Brunner, and *H. laminata* of the same author.[47]

A comparison of "*Homalopteryx*" *scotti* with various genera demonstrates that it represents a new genus probably as near to *Pinaconota* Saussure [48] as to any other genus known at this writing.

DRYADOBLATTA [49] new genus

Differing from *Pinaconota* Saussure chiefly in the smoother, more glabrous surface, the heavy robust build, in the occipital interocular space in the female being distinctly broader than the distance between the ocellar spots, in the slender palpi, in the corneous tegmina, in the convex dorsum of the female abdomen, in the two instead of one distal spine on the ventro-cephalic margin of the cephalic femora, the remainder of which margin has the spination reduced to a single premedian group of two, in the caudal metatarsus being subequal in length to the remainder of the tarsus, and with its pulvillus reaching distad for two-thirds of the length of the article, the latter completely unarmed ventrad.

In the present incomplete state of our knowledge of the diagnostic features of the genera placed in the Epilamprinae, and in the absence of any phylogenetic concept of their classification,

[46] Ann. and Mag. Nat. Hist., (8), x, p. 431, pl. 10, figs. 1 and 2. [♂, ♀; Summit of Mount Tucuché, Trinidad, 3100 feet elevation.]

[47] For a discussion of *Homalopteryx* see Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., LIV, pp. 236–237, (1927).

[48] Rev. Suisse de Zool., III, pp. 333, 337, (1895). Genotype—*Blatta bifasciata* Saussure, 1862.

[49] From *Dryas*, a wood-nymph, and *Blatta*, in allusion to the bromeliadicolous habits of the genus.

it seems best to compare *Dryadoblatta* with *Pinaconota*. Future study may show the two genera are not closely related, but it is not possible at this writing to attempt an analytic treatment of the genera of the subfamily. It is certain, however, that *Dryadoblatta* is not closer in relationship to any of the other genera, and its agreement with *Pinaconota* in many features is marked.

Generic Characters. Form of female broad ovoid, depressed; surface glabrous, texture corneous. Head of female visible cephalad of pronotum as seen from dorsum; in cephalic aspect broad cordiform; occiput very broad, distinctly broader than inter-ocellar distance, slightly greater than width between antennal scrobes, occipital outline arcuate in cephalic aspect; face subdeplanate: palpi slender; distal article slightly longer than penultimate, not expanded. Pronotum of female semicircular in outline, caudal margin subtruncate, caudo-lateral angles narrowly rounded; lateral portions of pronotum weakly deflexed and subconcave dorsad. Tegmina of female abbreviate, lanceolate, reaching to base of sixth abdominal tergite, corneous; sutural margin sharply oblique arcuato-truncate in distal half; apex narrow, but broadly rounded and subsutural in position: venation evident but not conspicuous; anal sulcus well defined, regularly arcuate, humeral trunk similarly indicated: marginal field broad, but not reaching middle of tegmen, subconcave dorsad. Wings of female reaching to tegminal apices when in repose; costal veins simple, tracheate, non-clavate; medio-discoidal and medio-ulnar areas narrow, subequal; discoidal, median and ulnar veins in distal three-fourths subparallel. Cephalic femora with ventro-cephalic margin armed distad with a pair of unequal spines, followed proximad by a series of spinulations and finally by a proximal pair of short, stocky spines; ventro-caudal margin with two well-spaced spines in distal half. Median and caudal femora having both ventral margins with pronounced spines. Caudal tarsi compressed; metatarsus subequal in length to remaining tarsal joints together, with pulvillus extending proximad for two-thirds of metatarsal length, the proximal section narrow and acute; venter of metatarsus completely unspined; second to fourth tarsal joints with marked pulvilli; arolia large; tarsal claws equal, margin simple.

GENOTYPE.—*Homalopteryx scotti* Shelford.

At a casual glance the genotypic species could readily be mistaken for a shorter winged relative of *Nyctibora laevigata* (Drury), of Jamaica and Hispaniola, its coloration strongly suggesting that species. Any more extensive examination, however, shows the many points of difference which at once remove *Dryadoblatta* from consideration with *Nyctibora*, and place it in the Epilamprinae.

PERISPHAERINAE

New Genera and Species

In 1927 Rehn and Hebard [50] tentatively referred to the genus *Poroblatta* Hebard,[51] two West Indian species which were described in 1892 and 1893 by Brunner as *Parasphaeria nigra* [52] and *Perasphaeria* (sic) *rufipes* [53] respectively. At the time the manuscript of their West Indian study was prepared no males of typical *Poroblatta* were accessible, as those authors then stated, and in consequence their assignment was made tentatively. Recently Hebard, from the evidence of the types of *nigra* and *rufipes*, has concluded [54] that those two are specifically inseparable, and I am following him in using the name *nigra* for the species. Male specimens of both *Poroblatta* and *Acroporoblatta* Hebard [55] are now available, and it is evident that *nigra*, represents a very distinct undescribed genus.

NAUCLIDAS [56] new genus

This very distinct genera is at once separable from *Colapteroblatta*, *Poroblatta*, *Acroporoblatta*, and *Galiblatta* Hebard, *Mioblatta* Saussure, *Cariacasia* Rehn and *Brachycola* Serville by the male sex having abbreviate lateral tegmina, instead of being fully alate as in those mentioned. From *Oxycercus* Bolivar the new genus is distinguished conversely by possessing lateral slip-like tegmina instead of being apterous, as well by abdominal features.

[50] Bull. Amer. Mus. Nat. Hist., LIV, p. 318.

[51] Trans. Amer. Entom. Soc., XLV, p. 123, (1919).

[52] Proc. Zoöl. Soc. London, 1892, p. 206, pl. 15, fig. 7, (1892). [♂, ♀; St. Vincent, West Indies.]

[53] Idem, 1893, p. 604, pl. 52, fig. 3, (1893). [♀; Balthazar, Grenada, West Indies.]

[54] Trans. Amer. Entom. Soc., LV, p. 384, (1829).

[55] Trans. Amer. Entom. Soc., XLV, p. 126, (1919).

[56] From Ναυκλείδα, *Nauclidas*, a Spartan ephor.

The genus *Parasphaeria* Brunner has the female sex with tegmina as in *Nauclidas*, but the structure of the dorsum of the pronotum shows that *Parasphaeria* is a member of the *Hormetica* complex along with *Brachycola*, while *Nauclidas* belongs to the assemblage which also comprises *Colapteroblatta*, *Poroblatta*, *Acroporoblatta* and *Galiblatta*. With the male sex of all of these genera before me I would place *Nauclidas* nearer *Galiblatta* [57] than to any other of the genera mentioned. In *Litopeltis* and *Cariacasia* the caudal metatarsus is proximally biseriately spinulose ventrad, which character at once removes these genera from the vicinity of the *Poroblatta* complex, although their general appearance much suggests the latter assemblage.

Generic Characters.—Subapterous in both sexes, integument strongly chitinized, surface crassly impresso-punctate. Head almost entirely covered by cucullate pronotum, broad subcordiform in outline; eyes sublateral; occipital interocular space in male very broad, equal to that between inner margins of antennal scrobes; palpi short, penultimate article shorter than ultimate; antennae equal to half of body length. Pronotum distinctly cucullate, concavo-declivent laterad, transversely subdepressed cephalad, lateral margins subreflexed and markedly cingulate. Tegmina reduced, lateral, sublanceolate, heavily chitinized, costal margin strongly cingulate, apex narrowly rounded. Wings absent. Abdomen with tergites strongly vaulted transversely; seventh tergite unusually developed in longitudinal extent, subcucullate, reaching to apex of abdomen, leaving but apex of ultimate tergite (supra-anal plate) exposed: cerci very short, heavy, little evident: seventh sternite relatively long; ultimate sternite (subgenital plate) asymmetrical. Limbs robust; ventral margins of femora unarmed; caudal tibiae with spines of extensor surface triseriate: tarsi very stout, short; caudal metatarsus no longer than three succeeding joints together, unspined beneath, pulvillus extending more than half way to base; tarsal claws equal, margins unspecialized; arolia large.

GENOTYPE.—*Parasphaeria nigra* Brunner.

[57] Proc. Acad. Nat. Sci. Phila., LXXVIII, p. 236, pl. 17, figs. 12 and 13, (1926). Genotype—*G. cribrosa* Hebard [French Guiana].

Poroblatta pluto[58] new species (Pl. IV, fig. 13; pl. V, fig. 5.)

This species is more nearly related to *P. cylindrica* Hebard,[59] from the Santa Marta region of Colombia, than it is to *P. apatela* of the same author,[60] from Santander, Colombia. From *cylindrica* the present species differs in the female sex in the smaller size, the more polished, although regularly impresso-punctate integument, in the greatly reduced and lateral lobiform tegmina, which but slightly surpass the caudal margin of the mesonotum, in the absence of wing rudiments, in the slightly longer limbs, in the longer tibial spines and in the proximally more narrowed caudal tibiae. From the female of *apatela* the present species can at once be distinguished by the narrower dorsal portion of the eyes (which are as in *P. cylindrica*), by the smaller size, the less deplanate face, the completely lateral tegmina, the absence of wing rudiments, and the more heavily impresso-punctate surface of the abdomen. The male of *pluto* is unknown.

Type.— ♀ ; Venezuela. [Academy of Natural Sciences of Philadelphia, Type no. 5488.]

Form as in the same sex of the other species of the genus; surface moderately polished, entire dorsum and much of venter regularly impresso-punctate.

Head in dorsal view narrowly visible cephalad of pronotum, in cephalic view slightly deeper than broad (as 49 to 45), broad cordiform in outline, that of occiput broadly arcuate, its curvature continued without break in the eye outlines, the eyes being not at all prominent, their dorsal sections little broadened, in lateral view their dorsal width less than half of the greatest dimension of the eye (as 10 to 22): face not deplanate, low arcuate in transverse section; interspace between internal margins of antennal scrobes somewhat less than the occipital width between eyes (as 23 to 26). Antennae in length reaching to slightly caudad of middle of body. Palpi short, relatively robust; ultimate article slightly shorter than antepenultimate article (as 9 to 10); penultimate article slightly shorter than ultimate (as 8 to 9), markedly infundibuliform.

Pronotum with lateral sections strongly decurved in transverse section, cephalad embracing head: cephalic margin arcuate and passing regularly into the gently arcuate and rather narrowly cingulate lateral margins; caudal margin truncate in its entirety, caudo-lateral angles narrowly rounded rectangulate: surface of

[58] In allusion to its somber coloration.

[59] Trans. Am. Entom. Soc., XLV, p. 125, pl. 19, fig. 4, (1919). [♀ ; Cincinnati, Sierra Nevada de Santa Marta, Magdalena, Colombia.]

[60] Trans. Am. Ent. Soc., XLV, p. 124, pl. 19, fig. 3, (1919). [♀ ; La Palmeta, Santander, Colombia.]

pronotum with a pair of indefinite shallow impressions cephalo-laterad, intermarginal sections of lateral portions of pronotum subconcave; pronotal impresso-punctations coarser and sparser than those of abdomen.

Tegmina reduced, chitinous, lateral, blunt lanceolate, but briefly surpassing caudal margin of mesonotum, greatest (proximal) width five-sevenths of greatest (costal) length: costal margin gently arcuate, crassly subcingulate; sutural margin largely oblique subtruncate; apex bluntly oblique arcuato-truncate; surface impresso-punctations as on pronotum. Caudal margin of mesonotum truncate. Metanotum with caudo-lateral sections moderately produced caudad, lateral margins subarcuate, narrowly cingulate, immediate angle of productions rectangulate; caudal margin of metanotum in consequence as a whole subconcave, its median section truncate. No wings present.

Abdomen of the type found in the same sex of all the known species of the genus. Ultimate tergite (supra-anal plate) transverse, its median length contained two and one-half times in greatest width of same (as 17 to 43); distal and lateral margins broadly and regularly arcuate, with very faint indication of a median emargination; surface of tergite subexcavate laterad, in its entirety finely subshagreenous. Cerci very stout, short, not more than half as long as ultimate tergite, broadly and obesely fusiform, depressed apex acute. Ultimate sternite (subgenital plate) large, rather broadly scoop-shaped in section; distal margin as seen in ventral aspect sinuately arcuato-obtuse-angulate, weakly concave ventrad of cerci, apex broadly arcuate.

Limbs robust. Ventro-caudal margins of median and caudal femora armed with three spaced spines in addition to distal one; ventro-cephalic margins of same unarmed; both ventral margins of cephalic femora unspined except for distal spine on each. Caudal tibiae moderately compressed, in lateral view regularly broadening in proximad two-fifths. All tibial spines relatively large. Caudal metatarsus equal to three-sevenths of entire tarsus (as 15 to 35), subcompressed, its pulvillus large and reaching distad nearly to base of article; second, third and fourth articles of tarsi very short, with pulvilli covering their entire ventral surfaces; arolia large; tarsal claws equal, their margins unspecialized.

General color very deep liver brown to blackish brown, the limbs burnt sienna to pale orange-rufous, the buccal region, ocellar spots and antennae proximad ochraceous-orange, the antenna becoming cinnamon-brown distad. Palpi pale ochraceous-orange. Eyes bister. Tibial spines burnt sienna, darker at tips. Pronotum with weak traces of paired yellowish clouds cephalo-laterad.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest (caudal) width of pronotum	Length of tegmen
♀, *type*	21	5.20	6.80	2.18
♀, *paratype*	21.2	5.29	7.05	1.93

In addition to the type I have before me a paratypic female bearing the same date as the type. It fully agrees with the latter in all features.

STYPHON [61] new genus

This is a very distinctive genus occupying an isolated position and not closely related to any of the previously known genera. Possessing abbreviate lateral tegmina in both sexes, no wings, and a smoothly cucullate pronotum with no traces of hormeticoid sculpture or cicatrices, it also is distinguished by lacking tarsal arolia. In *Styphon* the femora are all unarmed ventrad, except for a group of two or three spines proximad on the ventro-cephalic margin of the cephalic femora.

While the absence of arolia and the femoral armament strongly suggest *Parahormetica,* the smooth pronotum with non-reflexed margins, the elongate caudal metatarsal pulvillus, which reaches virtually to the base of the metatarsus, instead of but half way as in *Parahormetica,* and the absence of wing rudiments, will at once enable the student to distinguish *Styphon* from *Parahormetica.*

Generic Characters.—Subapterous. Head broad, face subdeplanate; eyes less remote occipitally than antennal scrobes. Pronotum regularly cucullate, vaulted, completely covering head; surface smooth, unimpressed, non-cicatricose and not deplanate; lateral and cephalic margins narrowly cingulate. Tegmina chitinous, lateral, lanceolate lobiform. Wings absent. Abdomen hardly depressed. Limbs robust, subfossorial; ventral femoral margins unarmed except for a proximal group (2–3) of stout spines on ventro-cephalic margin of cephalic femora; [62] distal femoral spines present on all femora except ventro-caudad on median femora; dorso-genicular spines present on median and caudal femora: median and caudal tibiae with extensor surface triseriately spinose. Caudal metatarsus unspined ventrad, with

[61] From Στύφων, *Styphon,* a Spartan commander.

[62] These spines are absent in rare instances.

pulvillus extending virtually to base. Arolia absent. Tarsal claws equal, margins unspecialized.

GENOTYPE.—*Styphon bakeri* new species.

Styphon bakeri[63] new species (Pl. IV, figs. 14–16; pl. V, figs. 6 and 7.)

Type.—♂; Island of Bonaire, Dutch West Indies [Dutch Leeward Islands]. August 5 to 30, 1922. (H. Burrington Baker.) [Academy of Natural Sciences of Philadelphia, Type no. 5489.]

Size moderately large (for subfamily): form elliptical, greatest body width approximately one-half greatest body length, subdeplanate ventrad, distinctly convex transversely on dorsal surface: texture of surface moderately polished, of dorsum of thoracic segments shallowly pauci-impresso-punctate; of dorsum of abdomen with sparse but distinct and seriately arranged depressed subshagreenous points, most evident along the caudal margins of the tergites, in the fashion seen in many members of the Epilamprinae; surface of venter of abdomen finely wrinkled laterad, except that of ultimate sternite (subgenital plate), which is entirely glabrous.

Head broad, short cordiform, width across mandibles greater than usual, lateral outlines regularly arcuate from mandibular bases dorsad across eyes, which are in no way protuberant, to the gently arcuate occiput; greatest width across eyes equal to twelve-thirteenths of greatest depth of head (as 59 to 65); occipital width between eyes moderately broad, equal to five-sevenths that between internal margins of antennal scrobes (as 25 to 34): face subdeplanate with a few scattered impresso-punctae and a faint transverse subcrescentic impression between ocellar spots. Eyes in lateral aspect subreniform, greatly narrowed ventrad, relatively broad dorsad. Antennae equal to half of body length. Palpi with ultimate article very slightly longer than antepenultimate article (as 12 to 11); penultimate article slightly shorter than antepenultimate article (as 10 to 11), stoutly infundibuliform.

Pronotum in dorsal view broad semicircular, the curvature faintly narrowed cephalad, greatest caudal width equal to one and two-third times greatest length; lateral sections of margin gently arcuate, regularly converging to the short and rather narrowly rounded cephalic section of the same; caudo-lateral angles narrowly rounded rectangulate, caudal margin as a whole transversely truncate, very shallowly and faintly concave laterad above tegminal bases; lateral portions of margin distinctly more broadly cingulate than is the case with the cephalic section: in

[63] Dedicated to its collector, Dr. H. Burrington Baker, the malacologist.

profile the pronotum outline is low convex; in transverse section it is strongly domed convex, more strongly arcuate and declivent laterad.

Tegmina separated by a distance at least three times their greatest width, tapering lanceolate, surpassing caudal margin of mesonotum by less than one-third of tegminal length; costal margin gently arcuate, sutural margin obliquely subarcuate, apex moderately rounded, costal margin strongly cingulate; greatest tegminal width equal to seven-tenths of tegminal length; surface of tegmina subshagreenously rugulose. Mesonotum with caudal margin transversely subtruncate. Metanotum with caudo-lateral angles moderately produced, subacutely angulate; caudal margin of metanotum very shallowly biconcave, median production faint; lateral margins subconvex, subcingulate.

Abdomen with lateral margins of more proximal tergites subcingulate: ultimate tergite (supra-anal plate) strongly transverse, its median length contained nearly three times in its greatest proximal width (as 19 to 55); distal margin gently bilobate, shallowly obtuse-angulate emarginate mesad, the margin rather broadly rounding proximo-laterad to above cercal bases; surface of tergite with distal three-fourths rather abruptly deplanate, a medio-longitudinal sulcus present distad, a similarly placed short carinula proximad. Cerci very short, hardly more than two-thirds as long as ultimate tergite, broad, nearly three-fifths as wide as long (as 8 to 14), blunt fusiform, moderately depressed. Ultimate sternite (subgenital plate) moderately asymmetrical, appreciably convex on ventral surface; distal margin gently arcuate from sinistral point to distinctly dextrad of middle, thence broadly rounding proximad to an appreciable but not deeply excavated concavity, at dextral side of which is placed the simple, slender, styliform, subdecurved dextral style; sinistral style placed near extreme sinistral point of distal margin, very short and simple, almost rudimentary.

Cephalic femora with portion of ventro-cephalic margin between proximal group of three stout, rather short spines and the single distal spine, sparsely and regularly pilose.[64] Caudal metatarsus but slightly shorter than remaining articles of caudal tarsus taken together (as 35 to 38); pulvillus extending as a narrow but pronounced tongue to virtually base of metatarsus; second, third and fourth articles of caudal tarsi all short but progressively decreasing in length distad; fifth article slightly longer than third and fourth together.

Allotype.— ♀ ; same date as type. [Academy of Natural Sciences of Philadelphia.]

[64] Under certain conditions this area might be considered spinulose, but by comparison with the true spines present it is evident that the structures seen are not true spines of any character.

Differing from the description of the male in the following noteworthy features.

Size appreciably larger than in male.

Head with outlines of genae, as seen in cephalic aspect, less strongly arcuate than in male, the head proportionately broader across eyes, the width there being but faintly less than greatest depth of head (as 67 to 70): occipital interspace between eyes slightly broader proportionately than in male, as 27 to 37 when compared with distance between internal margins of antennal scrobes. Antennae equal to one-third of body length.

Tegmina faintly broader in proportion to length, apex subacute; costal marginal cingulation faintly less elevated than in male.

Abdomen with ultimate tergite (supra-anal plate) in shape much as in male, its greatest median length contained a full three times in its greatest proximal width, bilobation of distal margin less evident than in male, median emargination but weakly indicated; surface of ultimate tergite not as in male, instead with a pair of appreciable concavities without definite boundaries present intermarginally disto-laterad, medio-longitudinal sulcus indicated distad, but no trace of proximal carinula. Cerci even shorter and stockier than in male, in length not more than half that of ultimate tergite, their greatest width more than two-thirds their length (as 8 to 11), apex very bluntly rounded. Ultimate sternite (subgenital plate) very ample, broad, distal margin oblique subarcuate laterad, faintly concave ventrad of cerci, passing into broadly arcuate medio-distal section.

General dorsal color ranging from nearly uniform deep fuscous to as pale as buckthorn brown on the thoracic tergites and tegmina, overlaid with a mummy brown to fuscous pattern on the thorax and abdomen. In the very dark intensive individuals no contrast is indicated on the dorsal surface except for an ochraceous-tawny pale border on the cephalic and lateral margins (particularly latter) of the pronotum, the marginal field of the tegmina and faintly so on the lateral border of the metanotum. In the recessive extreme the pale pronotum bears a sublyrate dark pattern, most emphasized in its transverse groupings and accompanied on the remainder of the pronotum by a stippling of hazel, which is subobsolete laterad and cephalad. From this pale extreme we find a progressive infuscation of the dorsum, by a lining of the humeral trunk of the tegmina, clouding of the caudal marginal sections of the pronotum, mesonotum and metanotum, and a general infuscate stippling of the whole dorsum of the abdomen, which in the pale recessive extreme is evidenced solely by hazel on the surface elevations. Cingulate margins of pronotum and tegmina lined with cinnamon-rufous to hay's

russet, in keeping with the pattern intensity. General color of ventral surface ochraceous-buff to pale ochraceous-tawny, becoming solidly infuscate distad on the abdomen: head in intensive extreme with a rather nebulously outlined fuscous interocular bar on the frons, the occiput with four longitudinal fuscous bars, into which the transverse bar breaks in individuals tending toward the recessive extreme; between antennal bases is present in intensive individuals another fuscous bar, with the intimation of a third at the clypeal base, both of which become incomplete to obsolete as the recessive phase is approached. Eyes bister; antennae dull zinc orange. Limbs of the ventral color, femora longitudinally lined dorsad and on ventral margins with russet; limb spines liver brown tipped with fuscous.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest (caudal) width of pronotum	Length of tegmen	Greatest width of abdomen
♂, Curaçao, *paratype*	25.4	7.8	12	4	13.8
♂, Bonaire, *type*	28	8	11.9	4.4	13.8
♂, Fontein, Aruba, *paratype*	23.5	7.8	11	4.3	12.7
♀, Bonaire, *paratype*	26.8	8.5	12.5	4.2	16
♀, Bonaire, *allotype*	33	9	13.2	4.8	16
♀, Bonaire, *paratype*	32.5	9.3	14.5	5.3	17.2

In addition to the type and allotype I have before me three males and three females taken on Bonaire, and having the same data as the type and allotype; one male from Fontein, Island of Aruba, taken August 5, 1922; three adult males and one immature male taken on the Island of Curaçao, July, 1922; and one adult female, one immature male and one immature female taken at Sint Christoffelberg, Campo Knip, Island of Curaçao, 1200 feet elevation, August 3, 1922. I have also before me two males, one female and one immature female taken on Bonaire, by Gabriel in 1923, and from the collection of Dr. Richard Ebner, of Vienna, Austria. Dr. Ebner sent these specimens to me for determination some time ago. All the adult specimens I am designating as paratypes.

The range of color tone and pattern is marked, and has been covered in the color description, while the size variation is illustrated by the measurements given. No noteworthy features of structural variation are evident, except that frequently but two spines are present proximad on the ventro-cephalic margin of the cephalic femora and very rarely none are evident.

Three of the immature specimens are in the instar preceding maturity, while the fourth is probably in one instar earlier.

Dr. Baker informs me that this insect is to be found amongst humus (leaves, sticks and dirt) and rubble, which collect in crevices and large cavities in the rocks, both those of the Tertiary limestone rim and the older metamorphosed and igneous rocks of the interior of the islands.[65] It is sluggish in the open, but wedges into the humus quite quickly.

It is most unexpected to find on these semiarid islands off the north coast of South America an entirely unrecognized genus which has no known close relative on the adjacent mainland. The genus *Parahormetica*, which is in some respects the nearest relative, is an inhabitant of regions widely removed in South America.

[65] See Baker, "Land and Freshwater Molluscs of the Dutch Leeward Islands," Occas. Pap. Mus. of Zool., Univ. of Michigan, no. 152, (1924).

Explanation of Figures

Plate I

Fig. 1.—*Cariblatta faticana* new species. Dorsal view of female (*type*). Turquino Peak, Cuba. (X 4.)

Fig. 2.—*Cariblatta faticana* new species. Dorsal view of ultimate tergite (supra-anal plate) of female (*type*). Turquino Peak, Cuba. (Greatly enlarged.)

Fig. 3.—*Pseudosymploce personata* new species. Dorsal view of ultimate tergite (supra-anal plate) of female (*type*). Loquillo National Forest, Porto Rico. (Greatly enlarged.)

Fig. 4.—*Nesomylacris fratercula* new species. Dorsal view of ultimate tergite (supra-anal plate) of male (*type*). Camagüey, Cuba. (Greatly enlarged.)

Fig. 5.—*Lamproblatta zamorensis* (Giglio-Tos). Dorsal view of ultimate tergite (supra-anal plate) of female. Puerto Bermudez, Peru. (Greatly enlarged.)

Fig. 6.—*Lamproblatta zamorensis* (Giglio-Tos). Palpus of female. Puerto Bermudez, Peru. (Greatly enlarged.)

Fig. 7.—*Lamproblatta mimetes* new species. Dorsal view of ultimate tergite (supra-anal plate) of male (*type*). Cuyabá, Matto Grosso, Brazil. (Greatly enlarged.)

Fig. 8.—*Lamproblatta mimetes* new species. Outline of tarsus of caudal limb of male (*type*). Cuyabá, Matto Grosso, Brazil. (Greatly enlarged.)

Fig. 9.—*Lamproblatta mimetes* new species. Apex of genital hook of male (*type*). Cuyabá, Matto Grosso, Brazil. (Greatly enlarged.)

Fig. 10.—*Lamproblatta albipalpus* Hebard. Dorsal view of ultimate tergite (supra-anal plate) of male (*type*). Hacienda Cincinnati, Sierra Nevada de Santa Marta, Colombia. (Greatly enlarged.)

Fig. 11.—*Lamproblatta albipalpus* Hebard. Palpus of male (*type*). Hacienda Cincinnati, Sierra Nevada de Santa Marta, Colombia. (Greatly enlarged.)

Fig. 12.—*Lamproblatta albipalpus* Hebard. Apex of genital hook of male (*type*). Hacienda Cincinnati, Sierra Nevada de Santa Marta, Colombia. (Greatly enlarged.)

Fig. 13.—*Lamproblatta albipalpus* Hebard. Dorsal view of ultimate tergite (supra-anal plate) of female (*allotype*). Hacienda Cincinnati, Sierra Nevada de Santa Marta, Colombia. (Greatly enlarged.)

Fig. 14.—*Lamproblatta gorgonis* new species. Dorsal view of ultimate tergite (supra-anal plate) of female (*type*). Gorgona Island, Colombia. (X 6.)

Fig. 15.—*Lamproblatta gorgonis* new species. Palpus of female (*type*). Gorgona Island, Colombia. (Greatly enlarged.)

Fig. 16.—*Lamproblatta gorgonis* new species. Outline of tarsus of caudal limb of female (*type*). Gorgona Island, Colombia. (X 6.)

Fig. 17.—*Lamproblatta romani* new species. Apex of genital hook of male (*type*). Manaos, Brazil. (Greatly enlarged.)

Fig. 18.—*Lamproblatta meridionalis* (Bruner). Apex of genital hook of male. Trinidad. (Greatly enlarged.)

Plate II

Fig. 1.—*Lamproblatta mimetes* new species. Outline of ultimate sternite (subgenital plate) of male (*type*). Cuyabá, Matto Grosso, Brazil. (Greatly enlarged.)

Fig. 2.—*Lamproblatta albipalpus* Hebard. Outline of ultimate sternite (subgenital plate) of male (*type*). Hacienda Cincinnati, Sierra Nevada de Santa Marta, Colombia. (Greatly enlarged.)

Fig. 3.—*Lamproblatta ancistroides* new species. Outline of ultimate sternite (subgenital plate) of male (*type*). Villavicencio, Colombia. (Greatly enlarged.)

Fig. 4.—*Lamproblatta ancistroides* new species. Outline of ultimate tergite (supra-anal plate) of male (*type*). Villavicencio, Colombia. (Greatly enlarged.)

Fig. 5.—*Lamproblatta ancistroides* new species. Palpus of male (*type*). Villavicencio, Colombia. (Greatly enlarged.)

Fig. 6.—*Lamproblatta romani* new species. Outline of ultimate sternite (subgenital plate) of male (*type*). Manaos, Brazil. (Greatly enlarged.)

Fig. 7.—*Lamproblatta romani* new species. Outline of ultimate tergite (supra-anal plate) of male (*type*). Manaos, Brazil. (Greatly enlarged.)

Fig. 8.—*Lamproblatta romani* new species. Outline of tarsus of caudal limb of male (*type*). Manaos, Brazil. (Greatly enlarged.)

Fig. 9.—*Lamproblatta romani* new species. Palpus of female (*allotype*). Manaos, Brazil. (Greatly enlarged.)

Fig. 10.—*Lamproblatta meridionalis* (Bruner). Outline of ultimate sternite (subgenital plate) of male. Trinidad. (Greatly enlarged.)

Fig. 11.—*Lamproblatta meridionalis* (Bruner). Outline of ultimate tergite (supra-anal plate) of male. Trinidad. (Greatly enlarged.)

Fig. 12.—*Lamproblatta meridionalis* (Bruner). Outline of tarsus of caudal limb of male. Trinidad. (Greatly enlarged.)

Fig. 13.—*Lamproblatta meridionalis* (Bruner). Palpus of female. Trinidad. (Greatly enlarged.)

Fig. 14.—*Pelmatosilpha rotundata* Scudder. Apex of genital hook of male. Costa Rica. (Greatly enlarged.)

Fig. 15.—*Muzoa madida* new species. Cephalic outline of head of male (*type*). Near La Emilia, Costa Rica. (X 6.)

Fig. 16.—*Muzoa madida* new species. Outline of left tegmen of male (*type*). Near La Emilia, Costa Rica. (X 3.)

Fig. 17.—*Muzoa madida* new species. Distal margin of ultimate sternite (subgenital plate) of female (*allotype*). Near La Emilia, Costa Rica. (X 5.)

PLATE III

Fig. 1.—*Pelmatosilpha rotundata* Scudder. Dorsal view of ultimate tergite (supra-anal plate) and cerci of male. Costa Rica. (Greatly enlarged.)

Fig. 2.—*Pelmatosilpha macu* new species. Dorsal view of ultimate tergite (supra-anal plate) and cerci of female (*type*). Manaos, Brazil. (Greatly enlarged.)

Fig. 3.—*Pelmatosilpha macu* new species. Outline of female (*type*). Manaos, Brazil. (X 3.)

Fig. 4.—*Pelmatosilpha miranha* new species. Dorsal view of ultimate tergite (supra-anal plate) and cerci of female (*type*). Rio Igaraparana, Peru. (Greatly enlarged.)

Fig. 5.—*Pelmatosilpha miranha* new species. Outline of female (*type*). Rio Igaraparana, Peru. (X 3.)

Fig. 6.—*Pelmatosilpha aterrima* (Walker). Dorsal view of ultimate tergite (supra-anal plate) and cerci of male. Canelos, Eastern Ecuador. (X 5.)

Fig. 7.—*Pelmatosilpha aterrima* (Walker). Distal margin of ultimate sternite (subgenital plate) of male. Canelos, Eastern Ecuador. (X 6.)

Fig. 8.—*Pelmatosilpha aterrima* (Walker). Cephalic outline of head of male. Canelos, Eastern Ecuador. (X 2.)

Fig. 9.—*Pelmatosilpha aterrima* (Walker). Extensor surface of caudal tibia of male. Canelos, Eastern Ecuador. (Enlarged.)

Fig. 10.—*Muzoa madida* new species. Outline of distal margin of ultimate sternite (subgenital plate) of male (*type*). Near La Emilia, Costa Rica. (Greatly enlarged.)

Fig. 11.—*Muzoa madida* new species. Dorsal view of ultimate tergite (supra-anal plate) and cerci of female (*allotype*). Near La Emilia, Costa Rica. (X 7.)

PLATE IV

Fig. 1.—*Eurycotis lixa* new species. Dorsal outline of ultimate tergite (supra-anal plate) of male (*type*). From banana ship from Jamaica. (X 6.)

Fig. 2.—*Eurycotis lixa* new species. Outline of ultimate sternite (subgenital plate) of male (*type*). From banana ship from Jamaica. (X 6.)

Fig. 3.—*Eurycotis lixa* new species. Outline of tarsus of caudal limb of male (*type*). From banana ship from Jamaica. (X 7.)

Fig. 4.—*Eurycotis lixa* new species. Outline of left tegmen of male (*type*). From banana ship from Jamaica. (X 3.)

Fig. 5.—*Eurycotis lixa* new species. Extensor surface of caudal tibia of male (*type*). From banana ship from Jamaica. (X 3.)

Fig. 6.—*Eurycotis lixa* new species. Lateral surface of caudal tibia of male (*type*). From banana ship from Jamaica. (X 3.)

Fig. 7.—*Eurycotis lixa* new species. Ventral outline of ultimate sternite (subgenital plate) of female (*allotype*). From banana ship from Jamaica. (X 6½.)

Fig. 8.—*Eurycotis lixa* new species. Extensor surface of caudal tibia of female (*allotype*). From banana ship from Jamaica. (X 3.)

Fig. 9.—*Eurycotis lixa* new species. Lateral surface of caudal tibia of female (*allotype*). From banana ship from Jamaica. (X 6½.)

Fig. 10.—*Eurycotis improcera* new species. Dorsal outline of ultimate tergite (supra-anal plate) of male (*type*). St. Croix, Virgin Islands. (X 8.)

Fig. 11.—*Eurycotis improcera* new species. Outline of ultimate sternite (subgenital plate) of male (*type*). St. Croix, Virgin Islands. (X 9.)

Fig. 12.—*Eurycotis improcera* new species. Apex of genital hook of male (*type*). St. Croix, Virgin Islands. (Greatly enlarged.)

Fig. 13.—*Poroblatta pluto* new species. Lateral surface of caudal tibia of female (*type*). Venezuela. (X 4.)

Fig. 14.—*Styphon bakeri* new genus and species. Cephalic outline of head of male (*type*). Bonaire, Dutch West Indies. (X 3.)

Fig. 15.—*Styphon bakeri* new genus and species. Outline of ultimate sternite (subgenital plate) of male (*type*). Bonaire, Dutch West Indies. (X 6.)

Fig. 16.—*Styphon bakeri* new genus and species. Outline of tarsus of cauda limb of male (*type*). Bonaire, Dutch West Indies. (X 4.)

Plate V

Fig. 1.—*Nesomylacris fratercula* new species. Dorsal view of male (*type*) Camagüey, Cuba. (X 6.)

Fig. 2.—*Pseudosymploce personata* new species. Dorsal view of pronotum of female (*type*). Loquillo National Forest, Porto Rico. (X 3.)

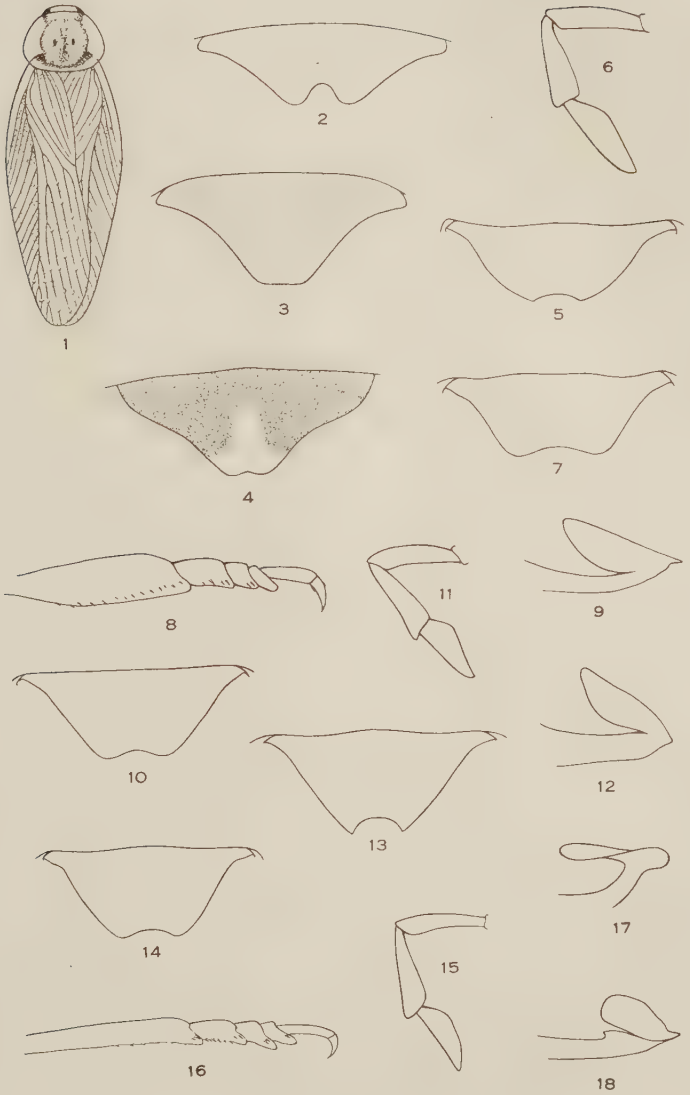
Fig. 3.—*Cariblatta faticana* new species. Cephalic view of head of female (*type*). Torquino Peak, Cuba. (X 8.)

Fig. 4.—*Eurycotis improcera* new species. Dorsal view of female (*type*). St. Croix, Virgin Islands. (X 3.)

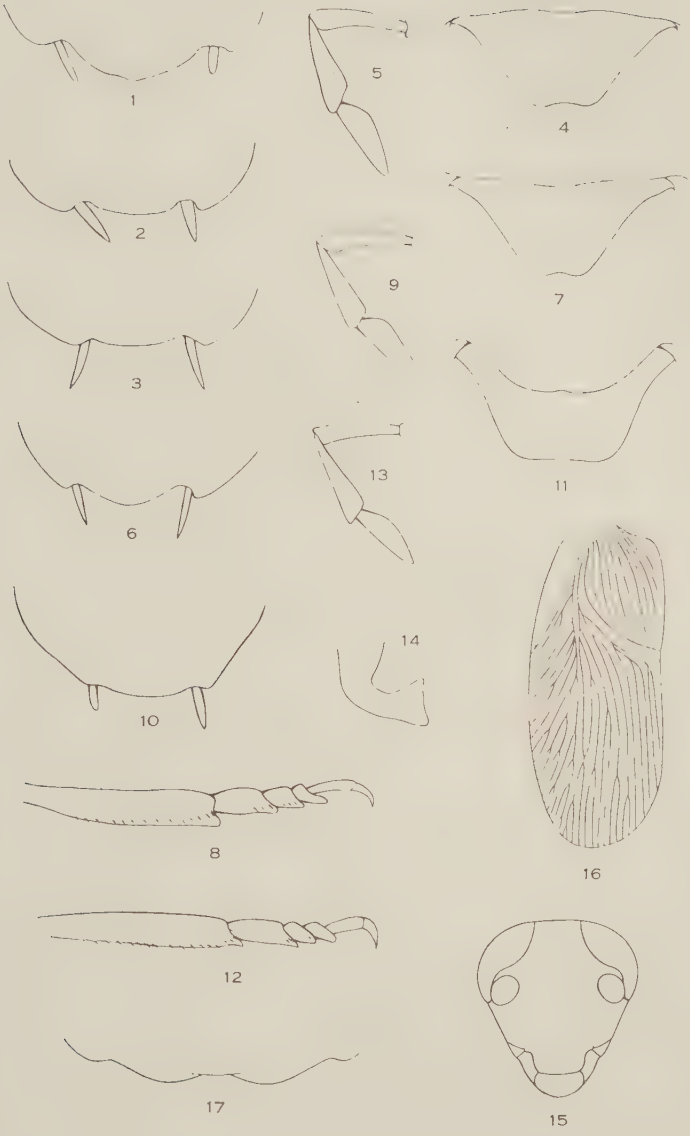
Fig. 5.—*Poroblatta pluto* new species. Dorsal view of female (*type*). Venezuela. (X 2.)

Fig 6.—*Styphon bakeri* new genus and species. Dorsal view of male (*type*). Bonaire, Dutch West Indies. (X 1½.)

Fig. 7.—*Styphon bakeri* new genus and species. Dorsal view of pronotum of female (*allotype*). Bonaire, Dutch West Indies. (X 3.)



REHN—NEOTROPICAL BLATTIDAE



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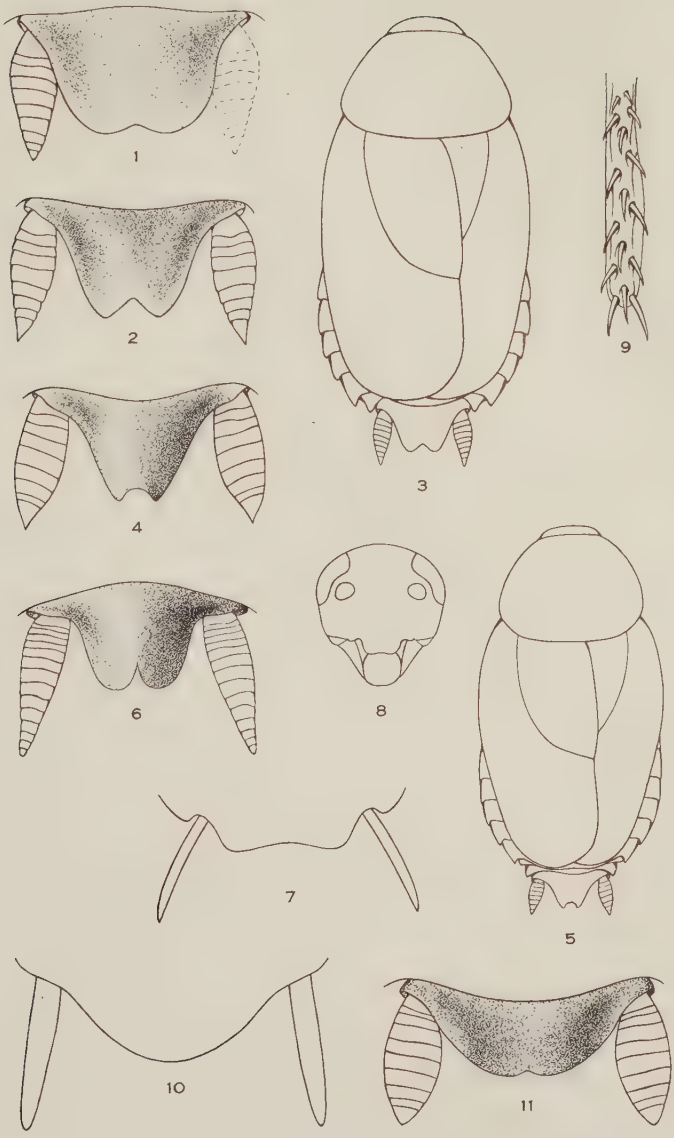

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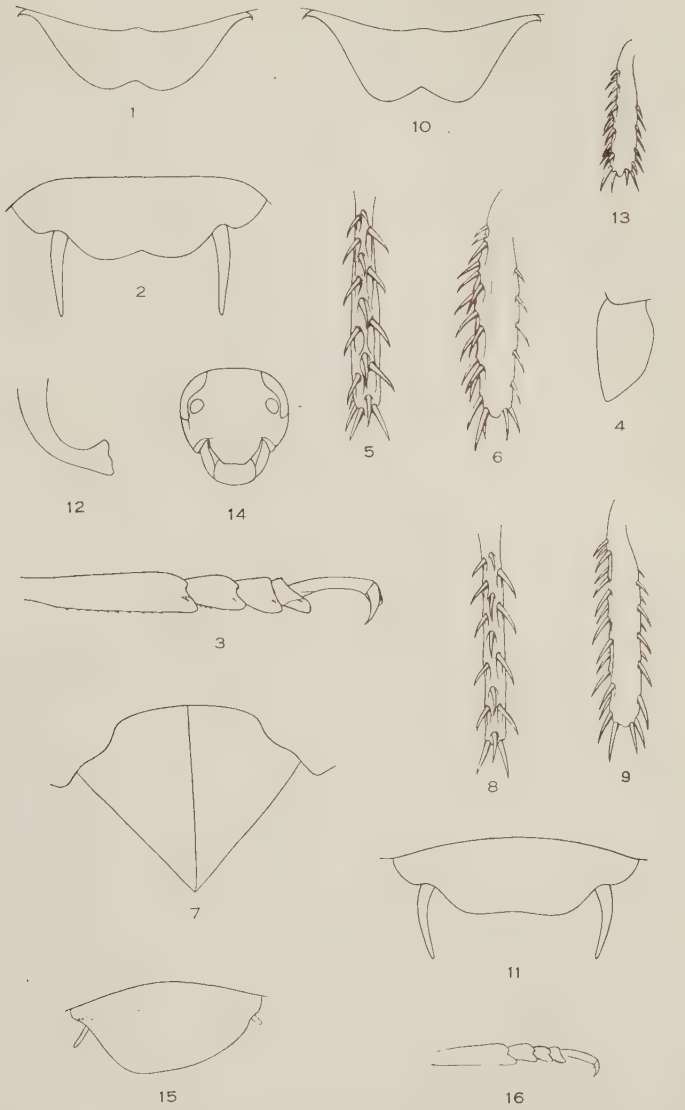

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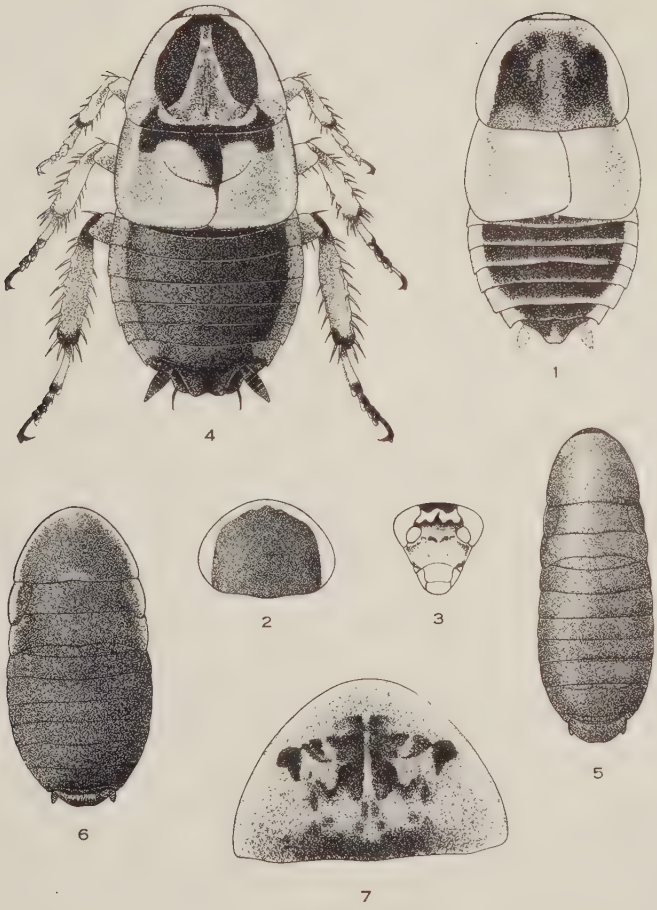

REHN—NEOTROPICAL BLATTIDAE

NOTES ON THE RACES OF OMUS CALIFORNICUS AND A LIST OF THE CICINDELIDAE OF AMERICA NORTH OF MEXICO

(COLEOPTERA)

BY WALTHER HORN

Berlin-Dahlem, Germany

During my short stay in the United States (August and September, 1928) I had the good opportunity to study the collections of Cicindelidae in the National Museum at Washington and in the museums of Philadelphia, Boston, Cambridge, New York, Brooklyn and Staten Island, and to see also some important private collections as those of Messrs. H. C. Fall (Tyngsboro, Mass.), Chas. Liebeck (Philadelphia, Pa.), and C. A. Frost (Framingham, Mass.). It gives me special pleasure to thank, here in an official way, the entomologists of all those museums, quite especially Dr. J. M. Aldrich, Dr. H. Morrison, Mr. L. L. Buchanan, Mr. W. S. Fisher, and Mr. H. S. Barber (Washington), Dr. C. H. Curran (New York), Messrs. G. P. Engelhardt and Karl Schaeffer (Brooklyn), Mr. Charles Leng and Mr. Wm. T. Davis (Staten Island), Mr. N. Banks (Cambridge), C. W. Johnson (Boston), Mr. F. Haimbach and Mr. J. A. G. Rehn (Philadelphia) as well as Messrs. J. Bequaret, H. C. Fall, Chas. Liebeck, and C. A. Frost, for all their friendly help. To Mr. Chas. Liebeck I am further indebted for his great kindness to give me a complete list of all localities of Cicindelidae represented in the collection of the Academy of Natural Sciences of Philadelphia. The study of the Casey types in the United States National Museum has enabled me to establish the synonymy of his species as cited in the accompanying check-list, and the result is in agreement with all my previons publications on the subject. In the following list, about two-hundred and three of Casey's described and named forms are cited, ninety-three of which belong to the genus *Omus* and

about one-hundred and seven to the genus *Cicindela*. I cannot consider anyone of all these forms as a valid species, and only twenty-seven as noteworthy races. The reason for this different interpretation is, according to my opinion, that Casey was accustomed to describe "localities" and "individuals". He did this, I believe, by giving too much attention to the minute differences between specimens, and too little to the identical features present. I am inclined the other way in the following list.

Before giving here a check-list of all North American Cicindelidae arranged according to the system I have worked out during the last forty years, I beg to say some words about the importance of the penis in the genus *Omus*. Casey and others have already drawn attention to this character. The plate accompanying this article shows twenty-five figures of penis-forms, coming from all races of *Omus californicus*. As far as I can see, the figures show the same relation as those found by Roeschke and myself (1891) and published at the same time in the "Monographie der paläarktischen Cicindelen":[1]

The Races of Omus californicus

The penis shows differences, not only as generally known in the form of its tip, but also in its general shape and in its size. The differences are in some cases characteristic of special races; in others they are variable, without any relation to races, in a purely individual way. I do not speak of the value of the penis in regard to the statement of species, as I only restrict myself here to the facts given for *Omus californicus* and its races. The figures on the plate do not show specific differentiation. What therefore can we learn from our figures?

1. Figure 1. Race, subspecies *audouini* Rche., is often difficult to recognize by other characters, such as shape, sculpture, etc., often showing very great superficial resemblance to the race *borealis* Cas. In such cases the penis will give us a ready means of identification.

2. Figures 2 to 5, 7 to 10, 16 to 21. Races *borealis* Cas., *vandykei* W. Horn, the true *californicus* Esch., *punctifrons* Cas., *laevis* G. Horn (including *sequoiarum* Cr.). All these forms vary individually very much, and do not allow any sharp distinction

[1] Beih. Deut. Ent. Zeit., 1891.

among themselves. In such cases, this (we might call it "indifferent") form of the penis can be used by systematists in the negative way, that is, by excluding those showing typical forms of the penis. Thus if we come to a doubtful systematic decision, when studying the shape, the sculpture, the geographical relation, etc., this "indifferent" form of itself will prove helpful.

3. Figure 6. Race *ambiguus* Schpp. shows a very long, large and stretched out penis; the largest width of which is lying within the first (apical) third and not within the middle third. The other characters of this race often show special difficulties towards the race *borealis*. Again I believe that the form of the penis will sometimes prove useful.

4. Figures 11 and 12. Races *lecontei* G. Horn, *intermedius* Leng (including *parvicollis* Cas.). The apical end, tapering in the form of a narrow hook, together with the large and extended form, permits a fairly good differentiation from all the other races. This is of special value in the recognition of *lecontei* G. Horn, as the other characters of this coastal form very often prove insufficient (especially for the females).

5. Figures 13 to 15. Race *fuchsi* W. Horn. Here the enlarged tip of the penis seems to be of a practical value for systematists, especially as this race can elsewhere be easily overlooked by other less developed characters.

6. Figures 22 to 25. Races *edwardsi* Cr. (including *intermediopronotalis* W. Horn) and *angusto-cylindricus* (including *nunenmacheri* W. Horn). The penis shows as its most remarkable and easily recognizable feature a special development of the concave (in the figures left) side. The prominence developed there within the middle third, a little nearer to the base than to the tip, shows a near relationship of these four forms in exactly the same way as their shape, sculpture, etc. have done. This correlation is very striking.

The résumé of this reflection will be that the exterior form of the penis has just the same importance in systematic differentiation as any other character. Which means, that it can sometimes prove of higher or only of individual value. It is possible that further researches will show whether or not the so-called "internal sac," "vesica," or "piece copulatrice" will admit of finer differentiations of other forms in this genus.

A New Subspecies of Cicindela formosa

Cicindela formosa subsp. **pigmento-signata** new subspecies

Differt a forma prioritatis elytrorum signatura maxima ex parte non flavescente sed cupreo-violacea; plerumque parte antica lunulae humeralis, parte postica mediaque lunulae apicalis, parte marginali rudimentaria fasciae mediae flavescentibus restantibus. —Long. 15–16 mm (sine labro).

Types.—Female; Mineola, Texas, October 2, 1906, (F. C. Bishopp). Male; Rosser, Texas, September 23, 1905, (C. R. Jones). [In the U. S. National Museum, and the Author's Collections.]

This localized form is of great interest, as we know of but a very few cases where a "special" pigmentation has invaded, in a similar way, the usually not or hardly pigmented parts of the elytra (the so-called "pattern" of the elytra of Cicindelidae is the spots where the ordinary pigment is missing or hardly developed!). I draw attention in this sense to *Cicindela hybrida* subsp. *coerulea* Pall. or *C. peringueyi* subsp. *immaculipennis* W. Horn. All such cases are of greater interest from the anatomical standpoint as regards the origin and development of pattern, especially if they show a localization at the same time.

Check List of the Cicindelidae of America North of Mexico

SYMBOLS AND ABBREVIATIONS

The roman numerals I, II, III, etc., designate the larger races and the letters a, b, c, etc., designate lesser forms of these races.

The following symbols refer to the various colors and color patterns, etc.

c less violaceous or cyaneous
cc more violaceous or cyaneous
cfl all lunulae or fasciae confluent at the margin
cmpl pattern fully developed but not enlarged
con middle marginal spot connected with the discoidal one
dlc pattern reduced
dlt pattern enlarged
F form in the most general sense
inorn pattern completely missing
isol isolated
mtl dorsal surfaces of a brassy metallic sheen
n less black areas present
nn more black areas present
r dorsal surfaces reddish cupreous
v less green present
vv more green present
vc green-violaceous to cyaneous-green

The explanation of the signs used, and of the abbreviations of the localities used, may be found in Leng's Catalogue of the Coleoptera of America North of Mexico, 1920. The following are additional ones used in the present list.

Co. County
Gardiner I. Gardiner Island, Long Island, N. Y.
Key W I. Key West Islands, Fla.
Padre I. Padre Island, Texas
StI. Staten Island, N. Y.
incl including
mount occurring only at a certain altitude
olim not occuring at present
spor sporadic

N-, E-, W-, S-, NE-, NW-, SE-, SW-, indicating north, east, west, south, northeastern, etc. part of the state cited.

Names within parentheses () refer to localities within the state cited.

AMBLYCHILA Say

1. **cylindriformis** Say	W-Kan, Col, Ariz to Ark.
a. piccolominii Reiche (*cylindriformis* J. Thms.)	Ariz to Tex (Llano Estacado).
2. **baroni** Riv. (*longipes* Cas., *enodis* Cas., *ventricosa* Cas.)	S-Ariz.
a. schwarzi W. Horn (*piccolominii* Riv.)	NW-Ariz, SW-Ut.

OMUS Esch.

1. **dejeani** Reiche (*foveatus* Cas. *robustus* Cas.)	BC & Vanc to Or, Mon.
2. **submetallicus** G. Horn	"Cal."
3. **californicus** Esch.	[*vide* subsp. V]
I. audouini Rche. (*parvulus* Cas., *delicatulus* Cas., *tacomae* Cas., *audens* Cas., *distans* Cas., *rugipennis* Cas.)	BC, Vanc to N-Cal (Siskiyou & Plumas Co.): up to 3000 ft.
II. borealis Cas. (*thoracicus* Cas., *shastanicus* Cas., *brevicornis* Cas., *cephalicus* Cas., *tenuiculus* Cas., *oregonensis* ‡ W. Horn, *mimus* ‡ W. Horn, *humeroplanatus* W. Horn, *aequicornis* Cas, *humeralis* Cas.)	S-Or (Josephine & Klamath Co.) to N-Cal (Del Norte, Siskiyou, Humboldt & Shasta Co.): up to 7800 ft.
III. ambiguus Schpp. (*socius* Cas., *solidulus* Cas.)	N-Cal (Shasta & Siskiyou Co.): 2500 to 4000 ft.

IV. vandykei W. Horn, *cupreonitens* Blsd. & Reyn., *reynoldsi* Cas.)	N-Cal (Humboldt Co.); "Oregon": up to 1200 ft.
V. californicus Esch. (*xanti* Lec., *hornianus* W. Horn, *turbulentus* Cas., *subparallelus* Cas., *diminuens* Cas., *aethiops* Cas., *debiliceps* Cas., *latipennis* Cas., *semilucens* Cas., *pullatus* Cas., *insulsus* Cas., *stolidus* Cas., *densicollis* Cas., *sculptilis* Cas., *modicus* Cas., *mimus* Cas., *argutus* Cas., *oregonensis* Cas., *elongatus* Cas., *lacertus* Cas., *vermiculatus* Cas., *leachi* Cas., *opacipennis* Cas., *pollens* Cas., *sparsus* Cas.)	Cal (Trinity & Shasta Co. to Santa Barbara & Kern Co. [Fort Tejon]): up to 2000 ft.
VI. lecontei G. Horn (*dunni* Cas., *maritimus* Cas., *regularis* Cas., *ventricosus* Cas., *elongatus* ‡ W. Horn, 1903)	Cal (Mendocino Co. to Santa Barbara [Gaviota]): Coast
VII. intermedius Leng (*blaisdelli* Cas., *fuchsi* ♂ W. Horn, *maurus* Cas., *procerus* Cas., *torvus* Cas., *cribripennis* Cas.)	Cal (Placer to Mariposa Co.): 1500 to 2500 ft.
a. parvicollis Cas. (*ovipennis* Cas., *spissipes* Cas.)	S-Cal (Tulare to Tuolumne Co.): 3000 to 4000 ft.
VIII. fuchsi ♀ W. Horn (*laticollis* Cas.)	Placer to Tuolumne Co.: 4000 to 5000 ft.
IX. punctifrons Cas. (*confluens* Cas., *punctatulus* Cas. *in litt.*, *fraterculus* Cas., *degener* Cas.)	Cal (Trinity Co. Sierra to Eldorado Co.): 2500 to 7000 ft.
X. laevis (levis) G. Horn (*opacellus* Cas., *peropacus* Cas., *remissus* Cas., *tularensis* Cas., *temperatus* Cas., *gracilior* Cas., *subsericeus* Cas., *compositus* Cas., *sparsellus* Cas., *antennalis* Cas., *brevis* Cas., *collaris* Cas., *sinuosus* Cas.)	Cal (Tuolumne to Tulare Co.): 4000 to 12000 ft.
a. sequoiarum Cr. (*lugubris* Cas., *sierricola* Cas., *longitarsis* Cas., *horni* Lec., *asperatus* Cas., *difficilis* Cas., *propinquus* Cas., *punctatus* Cas., *trapezicollis* Cas., *marginalis* Cas., *farctus* Cas., *callosus* Cas., *erraticus* Cas., *mariposae* Cas., *granosus* Cas.)	Cal (Eldorado to Tulare Co.): 3500 to 7000 ft [? 10000 ft]

XI. edwardsi Cr. (*montanus* Cas., *brunnescens* Cas., *lobatus* Cas., *ludicidicollis* Cas.)	Cal (Lake Tahoe, Placer & Eldorado Co.): 4000 to 9000 ft[? 3000 ft]
a. intermedio-pronotalis W. Horn (*pronotalis* Cas.)	N-Cal (Plumas Co.) [alt?]
XII. angusto-cylindricus W. Horn (*cylindricus* Cas.)	N-Cal (Lassen Co.) [alt?]
a. nunenmacheri W. Horn	N-Cal (Lassen Co.) [alt?]

MEGACEPHALA Latr.

subgen. TETRACHA Hope.

1. **carolina** L. (*carolinensis* Latr., *occidentalis* Klg., *virgula* J. Thms., *boisduvali* Gistl, *maculicornis* Cast., *mexicana* Gray, *splendida* Dokht.)	Va to Fla, Ga to S-Cal.
a. floridana Leng & Mutch.	S-Fla.
2. **virginea** L. (*virginata* L., "*Cicindela?*" Emmons)	Mass; betw LI, Pa, Fla, Tex, Col, Neb, SW-Ia, Ill & O.

CICINDELA L.

1. **formosa** Say (*luxuriosa* Cas., *fletcheri* Criddle)	betw O, Tex & Neb; Col to BC.
a. pigmento-signata m. (nov.) [2]	Tex.
I. generosa Dej. (*latecincta* Gould)	betw Wis, O, Me, Va, Ky & Ia; Kan, Neb, LI, StI.
(dlt-F) manitoba Leng	Man, Minn, Neb.
2. **lengi** W. Horn (*venusta* Lec., *versuta* Cas., *gracilenta* Cas.)	NMex, Col; Kan to Man to BC; Mon.
3. **limbata** Say (*limbigera* G. & H., *nympha* Cas.)	Col; Neb to Man to Alb.
(dlc-F) hyperborea Lec.	HudsBay to Alb; Neb.
4. **purpurea** O. (*marginalis* F., *ramosa* Gistl, *spreta* Lec. 1848)	S-Can (Vanc to Que); USA [perhaps missing betw: 1) SC, La & Fla 2) Or, Wy, Col & Cal]; LI, StI, Gardiner I.

[2] See description on page 76.

(v-F) auduboni Lec. 1845 (*graminea* Schpp. ex parte)	spor everywhere; more or less local betw Kan, Ariz, Cal, BC & Minn.
(nn-F) nigerrima Leng (*auduboni* Lec. 1856, *spreta* Lec. 1856, *raiana* T. W. Harris in litt., Frost)	spor in Mass & RI; more or less local betw Alb, Sask, Mich, Ill, Ut & Or.
I. lauta Cas. (*franciscana* Cas., *mirabilis* Cas., *graminea* Schpp. ex parte)	BC to Cal (? Mon).
II. splendida Hentz (*discus* Klg.)	betw Va, NC, La, Tex, Col, Neb, Minn & Mo; NY.
a. transversa Leng (*eldorensis* Cas.)	betw Col, Ia, Ill, NJ, Ga & Mo; Me.
b. denverensis Cas. (*conquisita* Cas., *oreada* Cas.)	Col, Neb, Kan.
c. ludoviciana Leng	SC to NMex; Col (? O).
III. cyanocephala Varas	Kan, Neb (? Pa to to NC).
IV. limbalis Klg. (*amoena* Lec., *militaris* Var., *splendida* Lec. 1856, *awemeana* Cas.)	betw Nfld, Alb, Mon, Nev, N-Mex, Col, Ky, O. & NJ.
V. auguralis Cas. (*inducta* Cas., *ardelio* Cas.)	Kan, Col, NMex.
VI. cimarrona Lec.	SW-Ut, Col, N-Mex.
VII. decemnotata Say (*lantzi* E. D. Harris, *albertina* Cas.)	Alas, BC, Alb to to Wy; Neb; Ut to Kan; Cal.
(cfl-F)? tanneri Knaus	Ut.
VIII. pugetana Cas.	BC, Wash, Mon, Id, Wy.
5. **ancocisconensis** Th. W. Harris (*catharina* Th. W. Harris, *dowiana* Cas., *carolinae* Cas., *eriensis* Cas.)	isol & local in NH, Vt, NY, Pa, Md, WVa, Va, NC, Ind, Ill.
6. **duodecimguttata** Dej. (*proteus* Kirby)	S-Can (BC to Nfld & NScotia); USA north-east of incl Minn, SD, Kan & Ga; Tex, LI, StI (?? west of Rocky Mts.)
(dlc-F) hudsonica Cas.	spor.
a. bucolica Cas. (*edmontonensis* Carr)	Alb to Man to SD; Minn.

I. repanda Dej. (*hirticollis* Gould, *baltimorensis* Lec., *unijuncta* Cas.)	S-Can (BC & Vanc to Que); Wash, Or; USA east of incl Minn, Col, Ariz; LI, StI, Gardiner I (?Ut, Id, Or).
(vv-or vc-F) hoosieri Mares (*duncani* Knaus)	spor.
7. **hirticollis** Say (*albohirta* Dej., *unita* Koll., *gravida* Lec.)	S-Can (? BC Alb); USA (? Mon & Wash); LI, StI, Gardiner I.
(dlt-F) ponderosa J. Thms.	spor everywhere; local in the South
(dlc-F) rhodensis Cald. (*nigritia* C. A. Davis, *abrupta* Cas., *shermani* Cas.)	local betw Me, L-Sup & Pa; LI, Cal.
8. **latesignata** Lec. (*tenuicincta* Blaisd. 1892, *obliviosa* Cas.)	S-Cal.
9. **tranquebarica** Herbst (*vulgaris* Say, *obliquata* Dej., *turbulenta* Cas., *wichitana* Cas., *crinifrons* Cas., *minor* Leng, *vulgaris-minor* E. D. Harris, *diffracta* Cas., *viridula* Varas)	S-Can; USA.
(mtl-F) *a.* horiconensis Leng (*borealis* E. D. Harris, *moapana* Cas.)	betw BC, Nfld, NY, Kan, Ut⩔ Nev.
(vc-cmpl-F) *b.* inyo Fall (*uintana* Cas)	E-Cal, Ut.
(v-or-vv-F) *c.* vibex G. Horn (*roguensis* E. D. Harris, *viridissima* Fall)	betw BC, Mon, Ut & Cal.
(n-cmpl-F) *d.* owena Fall	E-Cal, Ut.
(n-F) *e.* lassenica Cas.	S-Cal (San Diego, Rey), Ut.
I. kirbyi Lec. (*obliquata* Kirby)	S-Can & USA west of incl Man, Wis, Kan; NMex.
(cfl-F) admiscens Cas.	spor; local in NMex & Ut.
II. sierra Leng	Cal (Plumas to Calaveras Co), Nev.
III. parallelonota Cas.	Nev.
IV. propinqua Knaus (*arida* A. C. Davis)	S-Cal (Death Valley), Nev.
V. plutonica Cas.	Cal, Or, Id, Nev.
10. **tenuicincta** Schpp.	Col, Ut, NE-Cal.
11. **bellissima** Leng (*hyperborea* G. Horn 1866)	O.

12. **longilabris** Say (*albilabris* Kirby., *montana* Lec., *uteana* Cas., *chamberlainei* Knaus, *nebrascana* Cas., *calgaryana* Cas., *canadensis* Cas., *spissitarsis* Cas., *vestalia* Leng., *terracensis* Cas.)	Can & USA north of incl Cal, N-Mex, Ill & NY, Northern boundary: Yukon River & Mackenzie Bay
a. oslari Leng (*novaterrae* Leng, *columbiana* Cas., *ostenta* Cas.)	Can (BC to Nfld) USA betw Wash, Mon, Col & Nev; N-Ariz.
b. laurenti Schpp. (*densissima* Cas., *estesiana* Cas.)	BC; Alb to NMex; Ut (? Ariz).
I. perviridis Schpp. (*placerensis* Cas.)	Wash to Cal (?Ut).
13. **eureka** Fall	NW-Cal, Or.
14. **oregona** Lec. (*senilis* Cas., *sonoma* Cas., *quadripennis* Cas., *ovalipennis* Cas., *sterope* Cas.)	betw Alas (Yukon R.), Alb, Kan & NMex, Cal.
a. guttifera Lec. (*audax* Cas.)	Ariz, NMex, Col, Ut (? Kan).
(vv, cc or vc-F) scapularis Cas. (*mormonella* Cas., *nephiana* Cas., *provensis* Cas.)	Ut; Cal to BC; Vanc.
b. maricopa Leng	NMex, Ariz, Ut.
c. depressula Cas.	Cal to Wash; Id (? BC).
(n-mtl-F) oregonella Cas.	Wash (Mt Rainier), Ut.
15. **senilis** G. Horn (*exoleta* Cas.)	Cal (Alameda to San Diego & Kern Co.).
(v-F) frosti Varas	S-Cal.
16. **willistoni** Lec.	Wy.
(v-F) spaldingi Cas.	Ut.
a. echo Cas. (*amadeensis* Cas.)	NE-Cal to Ut; Or.
b. pseudosenilis W. Horn	SE-Cal.
17. **fulgida** Say	betw N Mex, Ia, Man, Mon & Col.
(nn-F) subnitens Cald.	spor.
a. parowana Wickh. (*wallisi* Cald., *azurea* Cald.	Ut, Wash, BC.
(mtl-F) westbournei Cald. (*elegans* Cald., *remittens* Cas.)	Wash, Ut, Man.
18. **pulchra** Say	Ariz to Tex to Kan; Col.
19. **pimeriana** Lec. (*viatica* Lec. 1856, *cochisensis* Cas.)	boundary line betw Ariz, NMex & Sonora.

20. **scutellaris** Say (*billingsi* Cas.)	betw Tex, Ark, Nev & Wy; Mon.
(cmpl-F) shantzi Cas.	Ark, Kan, Col.
(r-mtl-cmpl-F) modesta Dej. 1825 (*lecontei* Hald.)	betw Nev, Miss, Ky, NY & Ont; Man.
(cfl-F) criddlei Cas.	spor everywhere; more or less local in Ont, Man, Neb.
(vv-cmpl-F) rugifrons Dej. (*denticulata* Th. W. Harris, *oberleitneri* Gistl)	Que to SC; Ill, LI.
(v-c-inorn-F) unicolor Dej. (*carolina* E. D. Harris)	Mass to Fla to Tex.
(nn-inorn-F) nigrior Schpp.	Ga, Fla, Ala; olim L.I.
(nn-cmpl-F) obscura Say (*modesta* Dej. 1831)	RI to NC; LI, StI, Mich.
21. **sexguttata** F. (*guttata* Em., *varians* Lj., *quadriguttata* C. A. Davis, *levettei* Cas.)	betw Nfld, Man, Tex, Ala & Ga; LI, StI, Gardiner I, NMex (? Fla, Ariz).
(inorn-F) tridens Cas.	spor.
(nn-F) illinoensis Mares	spor.
(cc-inorn-F) violacea F. (*kansana* Knaus)	spor Dak to Tex; La, Tenn, Ia, SC. Local in Kan.
(mount-F) Harrisi Leng	over 3000′ in SE-Que to NC.
(con-F) *a.* patruela Dej. (*montana* Hentz)	betw Ga, RI, Vt, Minn & Col.
(nn-con-F) consentanea Dej.	LI, Pa, NJ, Md.
22. **nigrocoerulea** Lec. (*feminalis* Cas.)	Col, Ut; Ariz to Tex.
(v-F) robusta Cas. (*triplicans* Cas., *velutoidea* Cas., *snowi* Cas.)	Col; Ariz to Tex.
(cfl-F) bowditchi Leng	Col, NMex.
23. **horni** Schpp. (*anthracina* G. Horn)	Ariz to Tex.
(vc-F) ritteri Bat.	Ariz, Tex.
24. **obsoleta** Say	betw Col, Kan, Ark, La & Cal.
(compl-F) vulturina Lec.	Tex, NMex, Col, Kan.
(vv-F) prasina Lec.	Kan to Tex to Ariz.
a. santaclarae Bat.	Col, Ariz, NMex, Kan.

(nn-F) anita Dow	Ariz, NMex, Col, Kan.
b. juvenilis W. Horn	S-Ariz.
25. **punctulata** Ol. (*micans* F., *jenisoni* Gistl, *boulderensis* Cas., *prolixa* Cas., *fontinaria* Cas.)	S-Can & USA east of incl Man, Col & Ariz; Ut, Nev; LI, StI, Gardiner I.
(v-c-F) chihuahuae Bat. (*micans* Say etc.)	betw Nev, Kan, Tex & Ariz.
26. **tenuisignata** Lec.	Tex to Cal; Nev, Ut.
27. **severa** Laf.	NMex to Fla.
(n-F) alabamae Cas.	Ala to Tex.
28. **striga** Lec.	Fla, SC.
29. **lemniscata** Lec.	Tex to Ariz; Ut.
30. **abdominalis** F. (*ventralis* Newn., *faceta* Cas.)	LI; NJ to Fla to La.
a. scabrosa Schpp. (*extenuata* Cas.)	Fla, Ga.
31. **politula** Lec. (*cribrum* Cas.)	Tex.
32. **rufiventris** Dej. (*collusor* Cas.)	isol & local betw Mass, Ga, Tex, Tenn & Ill.
a. cumatilis Lec. (*guexiana* Chevr.)	Ky to Ala to Tex.
b. hentzi Dej. (*haemorrhoidalis* Th. W. Harris)	isol & local in Mass, NH, RI, (? Pa, Tex).
(dlt-F) niveihamata Frost	spor.
I. sedecimpunctata Klg. (*rubiventris* Chevr., *ventanasa* Bat., *sonorana* Cas.)	Tex to Ariz.
33. **flavopunctata** Chevr.	NMex, S-Ariz.
a. rectilatera Chd. (*decostigma* Lec.)	Tex, Fla.
34. **marginipennis** Dej.	isol & local in NY, Pa, O (? Kan).
35. **roseiventris linearis** W. Horn (*tascosaensis* Wm. T. Davis	Tex, Fla.
36. **carthagena** subsp. **haemorrhagica** Lec.	betw NW-Wy, N-Mex, Cal & Wash; Tex.
(n-F) woodgatei Cas.	NMex, Ariz.
(nn-dlc-F) bisignata Dohkt. (*nevadiana* Cas.)	Cal, Nev, Ut.
(nn-inorn-F) pacifica Schpp.	Cal, Nev, Ut.
a. arizonae Wickh.	Ariz (Gran-Can.), SW-Ut, Kan.

37. **sommeri** Mann. (*ruricola* Gistl, *ferrugata* Putz.)	? S-Cal (San Diego).
38. **arizonensis** Bat. (*viridisticta* Schpp. ex parte)	Ariz.
39. **wickhami** W. Horn (*viridisticta* Schpp. ex parte, *lemnisticta* Smyth)	Ariz.
40. **debilis** Bat. (*segnis* E. D. Harris)	SW-Tex, S-Ariz.
41. **celeripes** Lec.	betw Ark, Ill, Dak & Tex.
42. **cursitans** Lec.	betw Ill, Neb, Kan & La; Mon, Ala.
43. **unipunctata** F.	betw Ga, Mo, Ia, NY, LI, Minn & Tex.
44. **pusilla** Say (*terricola* Say)	betw BC, Man, Minn, Kan, Tex, NMex & Col; Ariz, Cal.
a. imperfecta Lec.	betw BC, Wy, Ut & Cal, (? Tex).
b. continua Knaus	Col to Cal.
c. cinctipennis Lec.	S-Can, (Man to Sask); USA, west of incl NMex, Kan & Dak.
d. cyanella Lec. (*sayanella* Cas.)	spor betw Man, Kan & Cal.
e. lunalonga Schpp. (*tuolumnae* Leng, *tularensis* Cas.)	Or to Cal.
45. **schauppi** G. Horn	Okla, Tex.
46. **circumpicta** Laf. (*collaris* Laf., *johnsoni* Fitch, *inspiciens* Cas.)	betw Neb, Tex & Ariz.
(c or vv-F) ambiens Cas.	Tex, Kan.
47. **californica** Mén.	S-Cal (Needles).
a. praetextata Lec. (*fulgoris* Cas., *stringens* Cas.)	Cal to Tex; Ut.
48. **trifasciata ascendens** Lec. (*serpens* Lec., *trifasciata* Lec. 1848, *tortuosa* Lec, 1851, *sigmoidea* Chd. 1854)	NJ to Fla; Ala to Tex (? NMex).
a. sigmoidea Lec.	Ut to S-Cal.
49. **gabbi** G.Horn	S-Cal (San Diego).
50. **chlorocephala** Chevr. (*smythi* E. D. Harris)	Tex (Padre I).

51. **dorsalis** Say (*signata* Dej., *munifica* Cas., *lineo-scripta* Cas., *semipicta* Cas., *media* Lec.)	Mass to Fla; LI (olim StI).
a. saulcyi Guér. (*castissima* Bat., *apricoidea* Cas.)	Tex to Fla; Ga, Key W I.
(dlc-F) venusta Laf. (*saulcyi* Schpp.)	Tex to Ga.
52. **pamphila** Lec.	Tex, La.
53. **hamata lacerata** Chd. (*hamata* G. Horn, 1876)	Fla & Ga to Tex.
54. **marginata** F. (*variegata* Dej.)	betw Me, Ala & Fla; LI, StI, Gardiner I, Key W I.
55. **blanda** Dej. (*tarsalis* Lec.)	Miss to NC.
56. **wapleri** Lec.	Ala to La.
57. **nevadica** Lec.	Nev to Neb.
(dlc-F) lincolniana Cas.	Neb.
a. (cfl-F) knausi Leng	betw Neb, Tex, Ariz & Ut; Mon.
58. **cuprascens** Lec. (*amnicola* Cas., *mundula* Cas.)	betw Minn, Ind, Ky, Miss, Tex & Man; Mon.
a. macra Lec. (*mercurialis* Cas., *topekana* Cas.)	betw Minn, O, La, Tex & Neb.
b. puritana G. Horn	S-Ont; NH to Md; Ky, Tex.
c. sperata Lec.	betw Cal, Col & Tex (? Kan).
(vv-F) marutha Dow	Tex to Ariz; Col.
(r-F) rubicunda E. D. Harris	NMex.
d. inquisitor Cas.	Tex.
59. **lepida** Dej.	NJ & NY to Neb; NMex to Wis; Minn, Man, LI.
(v-F) insomnis Cas.	spor
60. **togata** Laf.	Neb to Tex; NMex to Ala.
(dlt-F) fascians Cas.	spor
a. globicollis Cas. (*apicalis* W. Horn)	Ut to Kan; Neb.
61. **gratiosa** Guér.	NC to Fla; Ala.
a. hirticollis Lec.	Fla, Tex.

Subgenus **DROMOCHORUS** Guér.

62. **pilatei** Guér. (*maga* Lec.)	La, Tex.
63. **belfragei** Sallé (*pilatei* Lec., *sericea* Cas., *pruinina* Cas.)	Kan, Tex.

Explanation of Plate VII

Penes of various races of *Omus californicus* Esch.

Fig. 1.—*audouini* Reiche

Fig. 2.—*borealis* Casey

Fig. 3.—*borealis* Casey

Fig. 4.—*borealis* Casey

Fig. 5.—*borealis* Casey

Fig. 6.—*ambiguus* Schaupp

Fig. 7.—*vandykei* W. Horn

Fig. 8.—*vandykei* W. Horn

Fig. 9.—*californicus typicus*

Fig. 10.—*californicus typicus* (type of *hornianus* W. Horn)

Fig. 11.—*lecontei* G. Horn

Fig. 12.—*intermedius* Leng, and *parvicollis* Casey

Fig. 13.—*fuchsi* W. Horn

Fig. 14.—*fuchsi* W. Horn

Fig. 15.—*fuchsi* W. Horn

Fig. 16.—*punctifrons* Casey

Fig. 17.—*punctifrons* Casey

Fig. 18.—*punctifrons* Casey

Fig. 19.—*sequoiarum* Crotch

Fig. 20.—*sequoiarum* Crotch

Fig. 21.—*laevis* form *opacellus* Casey

Fig. 22.—*edwardsi* Crotch

Fig. 23.—*nunenmacheri* W. Horn and *intermedio-pronotalis* W. Horn

Fig. 24.—*angusto-cylindricus* W. Horn

Fig. 25.—*angusto-cylindricus* W. Horn

HORN—PENES OF OMUS CALIFORNICUS

A NEW GENUS OF ENEOPTERINAE (ORTHOPTERA, GRYLLIDAE) FROM HISPANIOLA

BY JAMES A. G. REHN

The most interesting new genus here described was secured by Dr. C. H. Arndt, of the Service Technique of the Department of Agriculture of the Republic of Haiti. While recognized by me several years ago from the female sex as probably a new genus, description was withheld until the male sex was secured by Dr. Arndt in the summer of 1929.

CHREMON [1] new genus

A member of the Podoscirtine division of the Eneopterinae and in its sum total of features probably nearer *Stenogryllus* Saussure,[2] also from "St. Domingo," than anything else known at present. From *Stenogryllus*, however, *Chremon* can at once be separated by the unusual spination of the dorsal (extensor) margins of the caudal tibiae, which, instead of having pronounced fixed spines and the intervening areas of the margins non-serrulate, have two or three fair-sized articulate spines distad and the remaining armament of the same margins fixed and spinuloso-denticulate. In addition the pronotum is subquadrate in dorsal aspect, instead of elongate cylindrical, with the caudal margin sinuate instead of straight, and the lateral lobes with their ventral margins convex; the rostrum is blunt and not protuberant, instead of appreciably produced, while the caudal metatarsi are unarmed dorsad, instead of armed with two denticules. The male sex of *Stenogryllus* has not been described and the tegminal characters of that sex are not known.

Generic Characters.—Elongate, slender, fully alate in both sexes; male tegmina with specialized stridulating dorsal field. Head subdepressed, no broader than pronotum; fastigium low, broad, non-produced; palpi with extensor margin of ultimate article low obtuse-angulate in profile, subtruncate distad.

[1] From Χρέμων, *Chremon*, one of the thirty tyrants at Athens.

[2] Mélang. Orth., II, fasc. vi, pp. 646, 694, pl. 17, figs. liii, (1878). Genotype.—*S. phthisicus* Saussure.

Pronotum subquadrate in dorsal aspect; lateral margins subparallel, cephalic margin concave, caudal margin biconcavely sigmoid; lateral lobes longitudinal, shallow, weakly narrowing cephalad, ventral margins arcuate. Tegmina of male with dorsal surface developed in its entirety as a stridulating field, tympanum divided by a single oblique vein; tegmina of female of usual simple type. Wings briefly caudate in both sexes. Cerci elongate, tapering, equalling ovipositor in female. Ovipositor elongate, deplanate; apical section strongly deplanate, acute lanceolate in dorsal and ventral views, surface of apical section shagreenous, particularly dorsad. Cephalic tibiae inflated proximad, auditory foramen apert on caudal face, conchate on cephalic face. Caudal tibiae with dorsal margins spinuloso-denticulate in distal three-fifths, with two to four (generally two) articulate spines distad on external margin, two to four (generally three) on internal: distal caudal tibial spurs subequal on external face, dorsal the longer on internal face. Caudal metatarsus short, unarmed dorsad.

GENOTYPE: *C. repentinus* new species.

Chremon repentinus[3] new species

Type.—♂; Coffee Station, Fond des Negres, Massif de la Hotte, Haiti. July, 1929. (C. H. Arndt.) [Academy of Natural Sciences of Philadelphia, Type no. 5490.]

Size medium (for subfamily); surface of most of body dully polished, sparsely pubescent except for surface (but not margins) of pronotum, which is bare, limbs more decidedly short pubescent, tegmina finely pubescent throughout.

Head with lateral margins subparallel; occiput low rounded, subdeplanate cephalad: fastigium but faintly elevated in profile, passing without indication into occipital line proximad, broad, equal in width to a single antennal scrobe, from median ocellus ventrad to clypeal border with a broad, rounded sulcation, which dorsad (at median ocellus) is circularly expanded, laterad of this sulcus between antennae is placed a pair of rather small, comma-like impressions. Eyes subreniform in basal outline, greatest width in same view two-thirds of greatest length, in dorsal view moderately prominent. Palpi subcompressed, proportions of antepenultimate, penultimate and ultimate articles as 11, 9 and 10; penultimate moderately infundibuliform; ultimate moderately broadened, ventral margin straight, dorsal flattened obtuse-angulate, apex of article truncate, dorsal surface concavely excavate distad.

[3] I.e. *unexpected*, in relation to its unusual tibial spination.

Pronotum with greatest caudal width faintly greater than greatest (lateral) length of pronotal disk; cephalic margin broadly and evenly concave; caudal margin biconcave with a weak obtuse-angulate median angle; surface of disk deplanate, rather narrowly rounding laterad into lateral lobes, except briefly caudad where the rounding is relatively abrupt: lateral lobes shallow, greatest depth caudad contained about two and two-thirds times in greatest length of lobes (as 14 to 38), moderately narrowing cephalad by the ascending curvature of the moderately arcuate ventral margin; ventro-caudal angle broadly arcuato-rectangulate; ventro-cephalic angle marked but distinctly rounded; surface of lobes impressed and whole pronotum subconstricted briefly cephalad of ventro-caudal angles, cephalad of this constriction a shallowly impressed longitudinal area is indicated for about one-third of length of lobes.

Tegmina surpassing apices of caudal femora by a distance nearly equal to pronotal length: dorsal field relatively narrow, with its greatest width at three-fifths of length of same, apex subacute; anal vein strongly flexed, bisinuate, the more proximal rectangulate, more distal obtuse-angulate; but one of three axillary veins complete, this median and straight in greater part of its length, more sutural one relatively short and joining sutural margin, more costal after a nearly straight course turning at an obtuse-angle and then acutely fusing with median axillary; oblique veins in two groups, one of four to six more proximal and abbreviate, the other of two more distal, markedly sinuate and coalescing very briefly a short distance from anal vein; chords three in number, the two mesad strongly arcuate; tympanum subovate, greatest width approximately two-thirds of greatest length, divided in two by an oblique vein, which is briefly arcuate costad, straight elsewhere: lateral field subequal in width distad to point of juxta-tympanal node, its greatest depth contained seven and one-half times in greatest length of same (as 22 to 165); costal veins sixteen to eighteen in number, obliquely arcuate, with exception of several of more proximal ones joined distad to the connecting vein, which is marginal in distal half of field. Wings surpassing tegminal apices by distance equal to pronotal length.

Abdomen moderately tapering, apex somewhat blunted: distal tergite (supra-anal plate) moderately transverse, moderately produced mesad with the margin arcuate, its surface vertically oblique excavate laterad, with a distinct and broad mediolongitudinal, sectionally trigonal sulcation, and adjacent to base of each cercus and mesad of same is an evident depressed area. Cerci elongate, tapering, relatively thick at base. Ultimate sternite (subgenital plate) moderately produced mesad into a scoop-like structure, which in ventral aspect has parallel

sides with its apex squarely transverse truncate, in profile ventral outline of the sternite is arcuate; normally visible portion of internal genitalia contained in the concave dorsal cup of this sternite and consisting distad of a pair of erect, acutely lanceolate, faintly incurved plate-like structures.

Cephalic femora moderately inflated, median pair less distinctly so: cephalic tibiae distinctly enlarged in proximal three-fifths, in both profile and extensor surface views; caudal foramen elliptical, cephalic foramen conchately inflated, the rimate aperture flexor in position and subequal to conchate inflation in length. Caudal femora moderately inflated proximad, not quite three times as long as pronotal disk; caudal tibiae subequal to femora in length, subtriquetrous in section, concavo-deplanate dorsad (i.e. extensor surface); distal articulate spines of dorsal margins increasing in length distad, two in number on external and three on internal, spinulations of margins other than articulate spines well spaced, slightly smaller proximad, completely absent in proximal section; external spurs (3) very short, median actually faintly longer than either of others, being subequal in length to distal external articulate marginal spine; internal spurs (3) regularly increasing in length dorsad, dorsal nearly equal to lateral extent of metatarsus: caudal metatarsus short, subcompressed, rounded dorsad, dorsal margins narrowly rounding, and with dorsal surface unspined; metatarsal spurs relatively long, subdecurved, in dorsal view diverging, embracing the cordiform, depressed succeeding article.

Allotype.— ♀ ; same locality as type. May 11, 1928. (C. H. Arndt.) [Academy of Natural Sciences of Philadelphia.]

Differing from the description of the male sex in the following noteworthy features.

Head with fastigium slightly broader than width of single antennal scrobe (as 11 to 9).

Tegmina elongate, actually and proportionately longer than in male, very slender, apices surpassing tips of tegmina by a distance equal to one and one-half times dorsal length of pronotum: dorsal field with greatest width contained nearly five times in length of same field (as 47 to 230); oblique sectors of dorsal field nine in number; lateral field regularly narrowing distad in distal two-fifths; greatest width of field contained six and two-thirds times in greatest length of same (as 22 to 165); costal veins eleven to twelve in number, less arcuate, nearly straight oblique, all except a few proximal ones connected distad by the connecting vein, which is nowhere truly marginal.

Ultimate abdominal tergite (supra-anal plate) in form and sculpture as in male. Cerci reaching to apex of ovipositor. Ovipositor valves elongate, length slightly greater than that of

caudal femora, moderately deplanate; in profile virtually straight: apical section deplanate, not wider than shaft of ovipositor, lateral margins meeting distad at an acute angle; lateral margins of dorsal valves of apex slightly more arcuate distad than those of ventral valves, the former margins with subrecurved, tuberculato-dentations, decreasing in size distad; shagreenous points of dorsal surface of apical section marked, directed proximad, largest proximad and becoming relatively minute distad; ventral surface without shagreenous points, lateral margins there with recurved dentations decreasing in size distad, from which marginal dentations extend obliquely proximo-mesad low carinulae, obsolete mesad, which in profile give this surface a file-like appearance. Ultimate sternite (subgenital plate) relatively broad, subdeplanate, in outline roughly quadrate; brief lateral margins straight, gently oblique convergent distad; distal margin broadly weak arcuate bilobate with a very shallow median emargination.

General coloration of head, pronotum and limbs pale ochraceous-orange; of abdomen prout's brown with much pale ochraceous-orange evident on dorsal surface, chiefly on distal tergites and proximad on the other tergites, indicating the basic quality of the paler color and the darker tone as a suffusion; tegmina pale clay color, the veins dull antimony yellow. Head with face ventrad of paired ocelli and infra-ocular portion of genae fuscous-brown; buccal region generally nearer cinnamon-brown, occasionally paling to tawny, and rarely nearly fuscous-brown; dorsad the infuscate area frequently involves a narrow area dorsad of each antennal scrobe; eyes pale chocolate to fuscous-brown; antennae mustard yellow to pale ochraceous-orange. Pronotum with the entire peripheral border margined with fuscous-brown, this very narrow cephalad, broader caudad, on lateral lobes cephalad expanded to cover most of lobes, narrowing caudad to a width subequal to that of caudal marginal border of disk. Cephalic coxae, ventral margins of femora and dorsal surface of median and caudal femora lineate with fuscous-brown; externo-dorsal margin of caudal tibiae occasionally similarly lineate, spinulations tipped with darker tone, apical spurs similarly colored. Ovipositor of general color, very broadly and evenly bordered laterad with fuscous-black; dorsal surface of apical section fuscous-brown, venter of same nearer chocolate.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest (caudal) width of pronotum	Length of tegmen	Length of caudal femur	Length of ovipositor
♂, *type*	22	3.44	3.61	16.2	8.5	—
♂, *paratype*	18.9	3.52	3.78	16.5	8.7	—
♀, *allotype*	16.9	3.44	3.69	19.3	9.5	9.3
♀, *paratype*	16.8	3.61	3.94	20	8.6	9.1

In addition to the type and allotype I have before me a paratypic male having the same data as the type, and six paratypic females having the same data as the allotype. The color range of this series has been covered in the above description, and it presents no noteworthy features except that the number of costal veins in the tegmina of the female may be as great as fifteen, while the distal articulate spines of the dorso-internal margin of the caudal tibiae range from two to four in number, with three the usual complement, and the same spines on the dorso-external margin may rarely be as many as four.

I also have before me a series of eight immature specimens, six bearing the same data as the type and two those of the allotype. Of these individuals three are males and five are females, and all apparently represent the instar preceding maturity except one male, which is in the next preceding. In these specimens the number of distal articulate spines on the dorsal margins of the caudal tibiae may be as few as one, but in the youngest specimen two and two are present. In color the immature specimens are essentially the same as the adults except that the alar pads are narrowly striped pale yellow and fuscous-brown, with lateral section of wing pads solidly fuscous-brown, while the dorsal surface of the abdomen is contrastingly of the general color with each tergite laterad and distad deep fuscous-brown. The ovipositor in the immature specimens is of the pale general color, unmarked with fuscous-brown.

Explanation of Plate VI

Chremon repentinus new genus and species

Fig. 1.—Male (type). Fond des Negres, Haiti. Dorsal view of pronotum. (× 5.)

Fig. 2.—Male (type). Fond des Negres, Haiti. Lateral view of head and pronotum. (× 5.)

Fig. 3.—Male (type). Fond des Negres, Haiti. Dorsal field of left tegmen. (× 3.)

Fig. 4.—Male (type). Fond des Negres, Haiti. External face of distal portion of caudal tibia with metatarsus. (Greatly enlarged.)

Fig. 5.—Female (allotype). Fond des Negres, Haiti. Ventral view of apex of ovipositor. (Greatly enlarged.)

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REHN—AMERICAN ENEOPTERINAE

STUDIES IN THE DIPTEROUS FAMILY EPHYDRIDAE
PAPER III [1]

BY EZRA T. CRESSON, JR.

This is the third paper of the series presenting the results of a study of the Ephydridae in the collection belonging to the Naturhistorischen Museums in Wien, and other material not strictly of the American Fauna.

Subfamily Notiphilinae (continued)

I have not been able to complete my studies of the genera *Notiphila* and *Hydrellia* for inclusion in the present paper. These will appear in the next and last instalment of the series.

HYDRINA Robineau-Desvoidy

1830. *Hydrina* Robineau-Desvoidy, Myod., p. 794.
1844. *Philygria* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 154.

The genus *Hydrina* was erected for the reception of seven new species, viz. *nitida*, *aurata*, *vernalis*, *nigricruris*, *maculipennis*, *viridula* and *cardaminis*. Haliday in 1839[2] used the name for a generic concept to include *Notiphila picta* Fall., *N. punctato-nervosa* Fall., *N. flavipes* Fall., *Ephydra sticta* Meig., *N. interstincta* Fall., *E. interrupta* Hal. and *E. posticata* Meig., considering *maculipennis* R. D. a synonym of *interstincta*. The genus was used in this sense until Loew in 1860[3] discarded Hydrina and substituted Philygria Stenhammar on account of what he supposed to be a prior use of the former. Coquillett, in his "Type-Species of the North American Genera of Diptera,"[4] attempted to designate *N. guttata* Fall. as the genotype of *Hydrina* on the supposition that it is synonymous with *H. vernalis* R. D. This synonymy, however, is not correct as is evident on comparing the original descriptions of these two species. Fallen states "alis albo-

[1] Paper I. Trans. Am. Ent. Soc., LI, pp. 227–258, (1925); II. Trans. Am. Ent. Soc., LV, pp. 165–195, (1929).
[2] Ann. Nat. Hist., III, p. 405, (1839).
[3] Neu. Beitr., VII, p. 24, (1860).
[4] Proc. U. S. Nat. Mus., XXXVII, p. 553, (1910).

biguttatis," while Robineau-Desvoidy says "alis sublimpidis . . . les ailes sans macula distincte." Coquillett thus cited a species not originally included in the genus, and therefore his designation is invalid. Nor can we consider Westwood's citation of *N. punctato-nervosa* Fallen (1813),[5] nor Becker's of *E. stictica* Meigen (1830),[6] for the same reason. Apparently a valid genotype of *Hydrina* has never been designated. I therefore designate *Hydrina maculipennis* Robineau-Desvoidy (1830) as the genotype of *Hydrina* Robineau-Desvoidy (1830).

This designation retains the Haliday-Loew-Becker conception of the genus, as *maculipennis*, which I have recognized, is congeneric with *Notiphila interstincta* Fallen (1813). Although this action sinks *Philygria*[7] as a synonym, the result seems to least affect the present nomenclatorial situation. The designation of *H. nitida*, if we use the "first species" rule, would have merely made the genus unrecognizable, or at least of doubtful status.

Hydrina punctatonervosa (Fallen)

1813. *Notiphila punctatonervosa* Fallen, Handl. K. Svenska Vet.-Akad., XXXIV, p. 254.

This well marked species is recognized by the short, closed appendages along the second, third and fourth veins.

In the Vienna Collection I found five specimens correctly determined by Meigen, Frauenfeld and Schiner; also four undetermined, from Dorpat.

Hydrina maculipennis Robineau-Desvoidy

1830. *Hydrina maculipennis* Robineau-Desvoidy, Easi. Myod., p. 795.
1830. *Ephydra interstincta* Meigen, Syst. Beschr., VI, p. 122. [nec. *Notiphila interstincta* Fallen, 1813].
1835. *Ephydra interstincta* Macquart, Hist. Nat. Ins., Dipt., II, p. 539.
1839. *Hydrina interstincta* Haliday, Ann. Nat. Hist., III, p. 405.
1864. *Philygria interstincta* Schiner, Faun. Austr., II, p. 253.
1896. *Philygria sexmaculata* Becker, Berl. Ent. Zeit., XLI, p. 191.

The above synonymy is not new, but based on Becker's citations under *sexmaculata*.

Zetterstedt[8] questioned the conspecific status of Meigen's and

[5] Syn. Gen. Brit. Ins., p. 153, (1840).
[6] Linder's Flieg. Pal. Reg., Fam. 56, p. 54, (1926).
[7] Genotype, *Notiphila flavipes* Fallen (1813) by Coquillett, (1910, p. 588).
[8] Dipt. Scand., v, p. 1919, (1846).

Macquart's determinations of *interstincta*, mainly on account of the smaller number of wing spots and on the paler color of the legs in that species. Becker concurred with Zetterstedt and renamed Meigen's misidentification, and in addition, considered it synonymous with *maculipennis* R. D., following Haliday in this respect, although the latter did not recognize the error of Meigen's determination.

I cannot see any valid reason for ignoring maculipennis in favor of sexmaculata if we accept Becker's synonymy, and the fact that the specimens before me of *sexmaculata* agree so well with Robineau-Desvoidy's description. On the other hand, I doubt the specific distinctness of *interstincta* and *maculipennis*, but believe that we probably have in the former merely a darker form of the latter, in which there is an intensification in the wing markings and in the color of the legs. The few specimens before me suggest that this variation is possible. Should this synonymy be satisfactorily proven, maculipennis will have to fall for interstincta.

The Vienna Collection has a female labeled (1) "interstincta" in Meigen's hand (2) "interstincta Coll. Winth.," and among the undetermined material I found two specimens from Hammern and Mödling, Austria.

Hydrina interstincta (Fallen)

1813. *Notiphila interstincta* Fallen, Handl. K. Svenska Vet.-Akad., 1813, p. 254.
1846. *Notiphila interstincta* Zetterstedt, Dipt. Scand., v, p. 1919.
1896. *Philygria interstincta* Becker, Berl. Ent. Zeit., XLI, p. 190.

Following Zetterstedt and Becker, I am retaining this name for the form similar to *maculipennis* R. D. having but five fuscous spots in the wings, and the femora and tibiae pale. As mentioned under *maculipennis*, I doubt if the two forms are distinct. Study of material from Scandinavia may throw some light on this situation. I have not seen this species.

Hydrina sticta (Meigen)

1830. *Ephydra sticta* Meigen, Syst. Beschr., VI, p. 121.
1830. *Ephydra pictipennis* Meigen, Syst. Beschr., VI, p. 122.
1839. *Hydrina sticta* Haliday, Ann. Nat. Hist., III, p. 405.

I concur with Becker in considering the synonymy of *pictipennis*.

In this species we have a recession of the maculipennis-interstincta wing pattern, in which the spot in the first posterior cell is retained and to a lesser extent the one in the second posterior cell.

Before me are three specimens in the Vienna Collection bearing Winthem's labels: one a male, without head, has three labels (1) "Paris" (2) "pictipennis Coll. Winth." (3) "pictipennis." This I select as the TYPE of *Ephydra pictipennis* Meigen and is so labeled. The other two females are labeled "Paratype." Among the undetermined material I found fifteen specimens mostly from Solac, Herzegovina.

Hydrina flavipes (Fallen)

1823. *Notiphila flavipes* Fallen, Faun. Suec., Hydrom., p. 12.
1830. *Ephydra melanostoma* Meigen, Syst. Beschr., VI, p. 123. [syn. Becker, 1902].
1830. *Ephydra minuta* Meigen, Syst. Beschr., VI, p. 124. [syn. nov.].

In this species we have an immaculate wing except for the clouds on, and faint whitish halos about, the crossveins. The legs are entirely yellow except, at most, the two apical segments of the tarsi which are dark; second costal section about twice as long as the third; face sparingly pollinose medianly, with orbits contrastingly denser, and lower portion prominent, giving a concave profile above.

In the Vienna Collection I found two females; the one labeled (1) "melanostoma Coll. Winth." (2) "melanostoma" is intact and I have selected and labeled it as the TYPE of *Ephydra melanostoma* Meigen. The other one, lacking the head, bearing one label similar to (1) above mentioned is labeled "Paratype." There were also two specimens labeled "flavipes Coll. Winth." which are evidently those Meigen determined as this species. They are but slightly paler examples of his *melanostoma*. A female labeled (1) "minuta Coll. Winth." (2) "Ephydra minuta," is apparently the specimen mentioned by Becker[9] as the type of *Ephydra minuta* Meigen, and I have labeled it as such, but it does not agree with Meigen's description as Becker also notes, in that the legs are yellow instead of black. I do not, however, concur with Becker in treating it as a valid species, but consider it merely a small individual of *flavipes* Fall.

[9] Zeit. f. Hym. u. Dipt., II, p. 312, (1902).

Hydrina posticata (Meigen)

1830. *Ephydra posticata* Meigen, Syst. Beschr., VI, p. 124.
1844. *Philygria nigricauda* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 248. [syn. nov.].

A species belonging to the flavipes-group. Face uniformly clothed with yellow pollen; the orbits but slightly denser. Mesonotum and pleura opaque, yellow to whitish with mesonotal vittae very narrow to almost wanting. Legs yellow; femora especially, and sometimes middle and hind tibiae, infuscated medianly; fore tibiae entirely yellow. Second costal section at least three times as long as third; crossveins rather narrowly clouded and the whitish halos not conspicuous. Facial profile typically vertical; the lower portion not produced, but in some specimens, especially the females, the latter is more noticeable; the upper portion concaved.

In the Vienna Collection I found a male labeled (1) "posticata Coll. Winth." (2) "posticata" which is selected and labeled TYPE of *Ephydra posticata* Meigen. Another specimen, a female bearing a label similar to (1), is considered and labeled "Paratype." Both agree with their original description.

Becker[10] misidentified this species although he evidently had examined the above mentioned specimens[11] and stated that it is synonymous with *Philygria fenestrata* Stenh. although Meigen specifically described the "Flugel glashelle." Becker describes *fenestrata* as "Flugel mit gefleckten Queradern" with "glashelle Fleck jenseits" of the crossveins, and the second costal section as one and one-half as long as the third. The type shows the second section at least two and one-half as long.

I believe Stenhammar described *posticata* under his new species *nigricauda*, and later students, not recognizing Meigen's species, have been using his name.

Among the Vienna material I found twelve specimens of this species from various localities in Austria.

[10] Linder's Fl. Pal. Reg., Fam. 56, p. 57, (1926).
[11] Zeit. Hym. u. Dipt., II, p. 312, (1902).

Hydrina trilineata (Meijere)

1907. *Philygria trilineata* Meijere, Tijd. v. Ent., L, p. 188.
1926. *Hydrina trilineata* Becker, Linder's Fl. Pal. Reg., Fam. 56, p. 58.

In this species which is very similar to *posticata*, the thorax is rather brownish, subopaque, the brown stripes rather broad; femora and tibiae black, or latter somewhat paler at extremities, the crossveins scarcely clouded.

In the Vienna Collection I found four specimens of this species from Germany and Austria.

Hydrina femorata (Stenhammar)

1844. *Philygria femorata* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 245, pl. 4, fig. 31.
1926. *Hydrina posticata* Becker, Linder's Fl. Pal. Reg., Fam. 56, p. 57. [nec. *Ephydra posticata* Meigen, 1830].

In this species we have the face whitish, with orbits more densely so, lower part prominent. Mesonotum faintly vittate; femora dark, and tibiae infuscated; second and third sections of costa subequal or the second, slightly longer. Crossveins broadly clouded, with halos more or less distinct in the first and second posterior cells; ultimate section of fifth vein one-half as long as penultimate of fourth.

I found five specimens of this species in the Vienna material from Austria, Bosnia, and Holland.

Becker was evidently in error as to the determination of *Ephydra posticata* Meigen although he had examined Meigen's type material.[12] In *femorata* we have the third costal section much longer than in *posticata*, and the whitish halos around the crossveins are much more extended and distinct in *femorata*.

Hydrina morans new species

Belonging to the femorata-group in which the third costal section is almost as long as the second. Similar to that species but the face is abruptly produced below, and mesonotal stripes broad.

Black; lower margin of third antennal segment, palpi, halteres, tarsi except apices, yellow. Wings slightly infuscated with crossveins broadly clouded and with distinct whitish halos in first and second posterior, and discal, cells.

Opaque; abdomen polished apically. Frons brownish medianly, with narrow white orbits; face whitish with orbits more

[12] Zeit. f. Hym. u. Dipt., II, p. 312, (1902).

densely so; cheeks and lower occiput white. Mesonotum grayish, with distinct, broad, acrostichal, dorsocentral, and intraalar stripes, of yellowish brown, the first three forming a large area posteriorly. Scutellum dark on disc; pleura sparingly gray, becoming brown above; abdomen brown basally.

Face slightly broader than the cheeks, concaved above, with lower part abruptly produced. Third antennal segment quadrate; arista pubescent above. Second and third costal sections subequal in length; second vein straight and distinctly diverging with third; penultimate section of fourth vein as long as ultimate of fifth, and one-third as long as ultimate of fourth; fifth vein bowed before posterior crossvein; third and fourth veins slightly diverging at tips. Length, 1.8 mm.

Type.—Male; Hieflau, Styria, August 8, 1891, (J. Mik), [A. N. S. P., no. 6379]. *Paratype.*—1 ♀; Achenthal, Tirol, Austria, (J. Mik).

Hydrina ochracea Oldenburg

1923. *Hydrina ochracea* Oldenburg, Deut. Ent. Zeit., 1923, p. 313.

A female I found among the undetermined material from Vienna, labeled "pusilla det. Frauenf.," seems to be this species, but does not entirely agree with Oldenburg's description. On the other hand, it does not seem to be *Philygria obtecta* Becker (1896), nor *Hydrina impunctata* Becker (1926), which are the only species known from Europe having the abdomen entirely pollinose. The second section of the costa in this specimen is at least three times as long as the third, and the crossveins are more or less clouded.

Hydrina interrupta (Haliday)

1833. *Ephydra interrupta* Haliday, Ent. Mag., I, p. 176.
1839. *Hydrina interrupta* Haliday, Ann. Nat. Hist., III, p. 406.

A relatively large species with the third costal section almost as long as second; crossveins broadly clouded and halos distinct. The face is pale yellow with orbits white; the mesonotum gray with broad, somewhat diffused, yellowish brown stripes.

The Vienna material contained four specimens which I determined as this species from Austria and Moravia.

Hydrina tirolis new species

A species belonging to the femorata-group, but without distinct vittation on the mesonotum, or only a suggestion of such as two to four anterior gray dashes.

Black; lower part of third antennal segment, palpi, base of halteres, middle and hind tarsi except apices, yellow. Knob of halteres, and fore tarsi, brownish. Wings immaculate, faintly brownish with crossveins faintly clouded, without noticeable halos.

Opaque; abdomen polished apically. Frons uniformly brownish; face rather sparingly whitish, with orbits more silvery; cheeks and lower occiput whitish. Mesonotum uniformly brownish with two to four faint, grayish dashes anteriorly; pleura grayish, to brownish above. Abdomen brownish basally.

Face as broad as cheeks, concaved above, produced and convex below. Third antennal segment rounded apically, slightly longer than broad; arista pubescent above. Wings elongate; third costal section almost as long as second; second vein straight, distinctly divergent with third; penultimate section of fourth vein as long as the ultimate of fifth, one-fourth as long as ultimate of fourth. Length, 1.8 mm.

Type.—Female; Achenthal, Tirol, Austria, (J. Mik), [A. N. S. P., no. 6380].

Hydrina nubeculosa (Strobl)

1909. *Philygria nubeculosa* Strobl, Wien. Ent. Zeit., XXVIII, p. 292.
1926. *Hydrina nubeculosa* Becker, Linder's Fl. Pal. Reg., Fam. 56, p. 56.

An entirely black species with halteres pale; base of tarsi somewhat diluted and the abdomen (which may be due to the general greasy condition of the specimen before me) ferruginous. Here we have a short almost round wing, with third costal section longer than second; clouds and halos about crossveins distinct.

In the Vienna material I found one specimen from Reichenstein, Austria? which I determined as this species.

Subfamily NAPAEINAE

I propose this name for a group including *Axysta*, *Hyadina*, *Pelina*, *Brachydeutera*, *Napaea*, *Parydra*, *Halmapota* and possibly *Canace*, and allied genera. The group is apparently intermediate between the Notiphilinae and Ephydrinae; probably an offshoot rather from the Ephydrine than from the Notiphiline phylogenetic branch.

The frontal bristles are generally lateroclinate, but few genera may have them proclinate. The face is weakly convex to gibbous, with the median area bare and the facial series of bristles paralleling the orbits. Anterior dorsocentral bristles absent or undeveloped.

Nostima picta (Fallen) new comb.

1813. *Notiphila picta* Fallen, Handl. K. Svenska Vet.-Akad., xxxiv, p. 254.
1834. *Hydrina picta* Haliday, Ann. Nat. Hist., iii, p. 405.
1917. *Philygiola picta* Hendel, Deut. Ent. Zeit., 1917, p. 42.

The genotype of *Nostima* Coquillett (1900) is *Nostima slossonae* Coquillett, that of *Philygiola* Hendel (1927) is *Notiphila picta* Fallen. The comparison of these two species does not show any differences of generic importance; the former, belonging to a group having the wings immaculate or with white spots and the thorax vittate; the latter to a group having the wings and thorax spotted with brown.

This pretty little species is easily recognized, but may readily be confused with some species of *Hyadina*. Here we have the frontal orbits conspicuously white; the mesonotum opaque, brownish in the male, with two parallel sublateral, silvery stripes, continuous to the like colored spots at the root of the velvety black scutellum; in the female these stripes are somewhat indistinct posteriorly. The femora and tibiae are black to brown, occasionally becoming almost yellow; the upper part of the pleura is opaque brown, but without any velvety black spots.

I do not think *Notiphila pullula* Fallen (1823) is conspecific, but cannot associate Fallen's description with any known species.

In the Vienna Collection I found seven specimens of this species correctly determined by Schiner and Frauenfeld, also three determined by Schiner which proved to be a species of *Hyadina*. In addition to the above, there were six others in the undetermined material.

This species also occurs in the western United States.

Axysta cesta (Haliday)

1833. *Ephydra cesta* Haliday, Ent. Mag., i, p. 177.
1860. *Axysta cesta* Loew, Neue Beitr., vii, p. 28.

Two specimens in the Vienna Collection from Berlin under this name are correctly determined, but both lack heads, and one has both wings missing.

Hyadina guttata (Fallen)

1813. *Notiphila guttata* Fallen, Handl. K. Svenska Vet.-Akad., xxxiv, p. 253.
1839. *Hyadina guttata* Haliday, Ann. Nat. Hist., iii, p. 406.

This is the genotype of *Hyadina* Haliday (1839). I do not find any reason why this generic name cannot be used for the present

group of species allied to *N. guttata* Fallen, and which is not to be confused with that one containing those species I have placed in Hydrina and belonging to another subfamily.

The present species is distinguished from *rufipes* Meigen by the broader and shorter head; cheeks scarcely broader than the third antennal segment; the latter longer than broad. Mesopleura with distinct velvety black spot, and there is a distinct whitish spot each side of the posterior crossvein.

Under this name in the Vienna Collection I found twelve specimens, mostly from Austria, correctly determined by Schiner, Frauenfeld and others; also two labeled "Ruppin" which proved to be *rufipes;* also one labeled "Kowarz" which proved to be humeralis. Under *Hydrina picta* I found three specimens of this species, and among the undetermined material there were four from Austria.

Hyadina humeralis Becker

1896. *Hyadina humeralis* Becker, Berl. Ent. Zeit., XLI, p. 195.

Very similar to *guttata,* but the wings are devoid of the whitish areas at the posterior crossvein.

Of this species, in the Vienna Collection I found a specimen under *guttata,* and among the undetermined material one from Hammern, Austria, (Mik), and another labeled "Brunswig."

Hyadina rufipes (Meigen)

1830. *Ephydra rufipes* Meigen, Syst. Beschr. Eur. Zweifl., VI, p. 126.
1860. *Hyadina nitida* Loew, Neue Beitr., VII, p. 28. [?nec. *Ephydra nitida* Macquart, 1835].

In the Vienna Collection, under *nitida,* I found one female labeled (1) "rufipes" (2) "rufipes Coll. Winth." which agrees with Meigen's description. The "zwei schwarzen punkten, welche Borsten tragen" on the face are distinguished in certain aspects and are caused by the shadows of the median prominence in the lower part of the two foveae. *Ephydra nitida* Macq. is described as having the "Pieds bruns; base et extrémité des jambes jaunes." I would hardly consider the two synonymous. However, the above mentioned specimen is evidently the one Meigen had and can be considered the type. I have so labeled it. This specimen serves to establish the species as distinct from *guttata* in having no mesonotal velvety black spot; wings without whitish

areas at the posterior crossvein, and the legs entirely yellow. *Ephydra nitida* Macquart (1835) is either synonymous or unrecognizable but *Hyadina nitida* of Loew [nec Macquart], is a misidentification.

Among the undetermined material from Vienna, I found eleven specimens of this species from Austria.

Hyadina fenestrata Becker

1903. *Hyadina fenestrata* Becker, Mitt. Zool. Mus. Berlin, II, p. 173.

Under this name in the Vienna Collection I found a male and a female from Palma, Canary Islands, (Simony, 1889), determined by Becker as *nitida*. They, however, seem to agree rather with Becker's description of *fenestrata* which is described as differing from *nitida* in lacking the velvety-black pleural spot but with distinct whitish spots on the wings, and may be characterized as follows:

Similar to *guttata* but the face rather sparingly pollinose with a median longitudinal, somewhat shining, stripe; third antennal segment quadrate; cheeks as in *guttata;* no velvety-black mesopleural spot. Wings with distinct whitish spots at posterior crossvein.

Another male from Grand Canaria, Canary Islands, (Simony), also determined by Becker as *nitida* Macq., is similar to the above, but the face is densely yellow pollinose, without the median stripe. This may not be *fenestrata*, but it is probable that the three specimens are part of the collection reported upon by Becker in his "Dipteren der Kanarish Diptera of the Canary Islands "[13] in which he records *fenestrata* from Grand Canaria, but does not mention any material of this genus from Palma.

Under this name I also determined three males from Tainan, Formosa, (Sauter; February), [Hungary], and two females from Manila, Philippine Islands, (Brown), [U. S. N. M.], which are, however, slightly smaller than the Canary Island specimens, but I do not see any other differentiating characters.

Hyadina pullipes new species

Similar to *guttata* but lacking the black pleural spot and the whitish wing spots of that species. Differing from *fenestrata* in having the legs for the most part black.

[13] Mitt. Zool. Mus. Berlin, IV, p. 152, (1908).

Black; third antennal segment except the narrow upper margin, extremities of femora and tibiae, tarsi except apices, apices of coxae, yellow. Halteres white or pale yellow. Wings hyaline, immaculate except the distinctly blackened crossveins, but with no whitish spots near the latter. Frons shining, slightly dusted with brown; face uniformly yellowish pollinose, becoming whitish on cheeks. Mesonotum shining, with two median aeneous stripes, anteriorly; pleura whitish pollinose, becoming brown on mesopleura, without velvety-black spot. Scutellum almost polished, without lateral basal velvety-black spots. Abdomen shining, becoming polished apically.

Structurally similar to *guttata*. Eyes large, somewhat oblique. Frons almost vertical in profile; orbits distinctly converging. Face twice as long as broad. Antennae slightly above center line of eyes; third segment slightly longer than broad. Cheeks one-half as broad as face. Abdomen ovate. Venation normal. (The depressed condition of the posterior portion of the mesonotum and the displacement of the scutellum caused by the pinning, precludes critical description of these parts). Length, 1.9 mm.

Type.—Male; Mount Victoria, New South Wales, Australia, (Biro; 1900), [A. N. S. P., no. 6381].

The species described from New Zealand by Tonnout and Malloch, under this genus are not congeneric with *guttata*, but probably belong to *Hydrina*.

Lytogaster abdominalis (Stenhammar)

1844. *Philygria abdominalis* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 238.

1896. *Lytogaster abdominalis* Becker, Berl. Ent. Zeit., XLI, p. 203, pl. 5, fig. 9; pl. 7, fig. 16.

In the Vienna material I found two specimens of this species from Hammern and Golling, Austria.

This species also occurs in North America.

Pelina aenea (Fallen)

1813. *Notiphila aenea* Fallen, Handl. K. Svenska Vet.-Akad., XXXIV, p. 253.

1830. *Ephydra glabricula* Meigen, Syst. Beschr., VI, p. 121. [syn. Haliday, 1839].

1839. *Pelina aenea* Haliday, Ann. Nat. Hist., III, p. 407.

I did not find any specimens of this species in the Vienna Collection determined by Meigen, nor could Dr. Becker, in 1902.[14] From Meigen's description and figure of the wing of *aenea*, I

[14] Zeit. f. Hym. u. Dipt., II, p. 312, (1902).

doubt if his specimens were conspecific with the species as here recognized.

We must therefore follow Haliday in recognizing this species which he considered synonymous with *Ephydra glabricula* Meigen, the types (male and female) of which I found in the Vienna Collection both labeled "glabricula Coll. Winth." Of these I select the male bearing an additional label "glabricula" in Meigen's hand as the type. It however lacks the antennae. The female from "Bordeau" is considered a paratype. In this collection I also found thirteen specimens under this name of which seven proved to be correctly determined, five proved to be *P. aenescens* and the other a species of *Parydra*. Among the undetermined material there were eleven specimens mostly from Austria.

Pelina aenescens (Stenhammar)

1844. *Telmatobia aenescens* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 210.
1856. *Pelina aenescens* Haliday, Ins. Brit., III, p. 345.

Very distinct from *aenea* and allies in having the thorax more shining and the mesopleura smooth and polished.

In the Vienna Collection I found five specimens under *aenea*, and seven undetermined from Austria, Bohemia, and Albania.

Brachydeutera argentata (Walker)

Twenty specimens of this species were found among the undetermined Vienna material, from Buenos Aires, Argentina; Chapult, Puebla, and Takubaya, Mexico. Also two specimens labeled (1) "ripicola det. Schiner" (2) "Austria Alte Sammlung." I doubt if this species occurs in Europe, but has been reported from the Canary Islands by Becker.[15]

Parydra aquila (Fallen)

1813. *Ephydra aquila* Fallen, Handl. K. Svenska Vet.-Akad., XXXIV, p. 247.
1844. *Parydra aquila* Stenhammar, Handl. K. Svenska Vet.-Akad., 1844, p. 187.

This species is the genotype of *Parydra* Stenhammar (1844), and is sufficiently different structurally from *Ephydra coarctata* Fallen, the genotype of *Napaea* R. D. (1830), to warrant the retention

[15] Mitt. Zool. Mus. Berl., IV, p. 152, (1908).

of *Parydra* for a group containing the present species, *Parydra pubera* Lw., *Parydra bituberculata* Lw., *Parydra quadrituberculata* Lw., and others.

The species is readily separated from those of the coarctata-group (*Napaea*) by the robust build, somewhat more shining appearance, the two armed scutellar tubercles, convex face and recessive chatotaxy.

The Vienna Collection contained thirty-six specimens of this species correctly determined by Meigen? and Schiner. There were also thirty-three specimens in the undetermined material, mostly from Austria, Hungary and Bohemia.

Parydra pubera Loew

1860. *Parydra pubera* Loew, Neue Beitr., VII, p. 32.

This species is easily distinguished from *aquila* by the long black pile and cinereous color of the vesture.

The Vienna Collection contained two specimens of this species probably determined by Loew, from Germany (Mik), and among the undetermined material there were seven from Albania and Sicily.

Napaea coarctata (Fallen)

1813. *Ephydra coarctata* Fallen, Handl. K. Svenska Vet.-Akad., XXXIV, p. 247.

1839. *Napaea coarctata* Haliday, Ann. Nat. Hist., III, p. 407.

This is the genotype of *Napaea* Robineau-Desvoidy (1830), a genus I consider distinct from *Parydra* Stenhammar (1844), on the more strongly developed chatotaxy, there being very distinct dorsocentrals in most of the species of *Napaea*. The scutellum here is rather elongate generally with an evident median, unarmed, apical tubercle. Other characteristics may be recognized in the facial development.

The coarctata-group, in which the second vein is more or less appendiculated, contains three European species known to me, viz. *coarctata* Fall., *littoralis* Meig. and *quadripunctata* Meig. These species are typically easily distinguished, but there are individuals which possess one or more of the characteristics of the other species, and are consequently difficult to place. This is true especially of those in poor state of preservation. The appendage of the second vein is variable and sometimes entirely

lacking, with hardly a trace of the usual infuscation at that point. Of course these specimens naturally suggest those in the fossarum-group, which group lacks this character. Unfortunately these species, in fact most of the species of *Napaea* and *Parydra*, are very homogeneous, offering very few well marked characteristics. After much study, however, I have been able to satisfactorily separate these species, making use of characters which at first appeared to be of no specific value.

As distinct from the other two, *coarctata* is more densely cinereous on the abdomen. The males have the lateral margins of the abdomen generally rounded, but occasionally there is an abrupt turning under of the tergite. This rounding of the abdominal margins will easily distinguish the males from those of *littoralis*. This abdominal characteristic is also shared by the males of *quadripunctata*, but that species may be distinguished by the strongly developed sublateral scutellar bristles. The scutellum in the present species is generally more elongate than in the others, the dorsum more thickly setulose, with the sublateral bristles often inconspicuous and indistinguishable from the surrounding setulae. A very good character is found in the whitish hairs of the middle coxae, no blackish bristle being present except in very rare instances.

In the Vienna Collection I found thirty-two specimens under this name, determined by Meigen? Wiedemann? Schiner, Egger, and Becker, and were with exception of two individuals correctly named. These two proved to be *littoralis* and *quadripunctata*. Among the undetermined material in the above collection I found about ninety-five specimens from Austria, Hungary, Bohemia, Bosnia, Dalmatia, Sicily, Switzerland, and Holland and the Canary Islands.

Napaea quadripunctata (Meigen)

1830. *Ephydra quadripunctata* Meigen, Syst. Beschr., VI, p. 117.
1839.. *Napaea quadripunctata* Haliday, Ann. Nat. Hist., III, p. 407.

Of this species, Becker in his paper on Meigen's types says "Ein Exemplar in der Winthen'schen Sammlung deutete ich als Parydra littoralis Meig.?" Meigen's original description mentions that this species was received from Prof. Wiedemann. I cannot doubt but that the female in the Vienna Collection

bearing labels: (1) "4-punctata Coll. Winth." (2) "4-punctata M." (the latter apparently in Meigen's handwriting) is at least a part of the original series. Label (1) was made subsequent to (2) and "Coll. Winth." is probably an error. It agrees with the original description and I have labeled it "TYPE Ephydra quadripunctata Meigen." The anterior rudiments of two median grayish stripes and the grayish spots at the lateral sutural regions are fairly conspicuous and are probably responsible for the specific name. I am further influenced in this selection by the determinations, of Schiner, Egger, Frauenfeld and others, as *quadripunctata*, a series of twenty-one specimens which they recognized as conspecific with Meigen's specimen, and as distinct from *littoralis*. In addition to the above mentioned specimens, there were three which proved to be *coarctata* and three, *littoralis*.

I consider this species quite distinct from *littoralis*. It is similar to *coarctata* in the revolute lateral abdominal margin of the male, but is distinguished from both in the following characteristics:

Scutellum more quadrate than in *coarctata*, not so noticeably setulose, the setulae being confined more to the lateral regions of the dorsum; the sublateral bristles are well developed and are generally nearer the base than the apex of the scutellum. Middle coxae with a conspicuous, long, black bristle. It is less shining than *littoralis*, the mesonotum generally entirely opaque olive brown.

Among the undetermined material belonging to Vienna I found thirty-five specimens, mostly from Austria, Hungary, and Sicily; also a specimen under *coarctata* and another under *littoralis*.

Napaea littoralis (Meigen)

1830. *Ephydra littoralis* Meigen, Syst. Beschr., VI, p. 116, pl. 60, f. 8.
1839. *Napaea litoralis* Haliday, Ann. Nat. Hist., III, p. 407. [error for littoralis].
1844. *Parydra litoralis* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 188. [error for littoralis].

This species was represented in the Vienna Collection by twelve specimens correctly determined by Schiner, Berganstamm and others. This series included two males and a female bearing the Winthem collection labels. One of these males labeled (1) "littoralis Coll. Winthem" (2) "littoralis," I select as the type

and labeled "TYPE Ephydra littoralis Meigen." The other two, bearing similar (1) labels, I consider Paratypes.

As distinguished from *coarctata*, the present species is more robust, more shining; the pollinose vesture sometimes very sparse. The lateral abdominal margins are sharp, the ventral lobes being angularly turned under. The scutellum is more convex, with the subdorsal bristles well developed, generally situated about midway between the base and the apex of the scutellum and easily distinguished from the sparse, surrounding hairs. One also notices the lighter color of the sternopleura in contrast with that of the darker mesopleura. The legs are more strongly setulose, not pale as in the fore-mentioned species; the anterior surface of the tibiae has two conspicuous shining areas; the wings are more strongly tinted with brown. The more general shining appearance will also distinguish the present species from *quadripunctata*.

In addition to the above, there were five specimens incorrectly determined, of which three proved to be *coarctata* Fallen, and two, *quadripunctata* Meigen. Among the undetermined material I found eighty-nine specimens from Austria, Hungary, Bohemia, Sweden and Holland; also one under *coarctata*, one under *quadripunctata* and one under *Ephydra riparia*.

Napaea nigritarsis (Strobl)

1893. *Parydra nigritarsis* Strobl, Wien. Ent. Zeit., XII, p. 280.
1926. *Napaea nigritarsis* Becker, Linder Fl. Pal. Reg., Fam. 56, p. 101.

This seems to be a mountainous species. It was originally described from the Styrian Alps. Before me are four specimens which I determine as this species, from Carinthia and Tyrolis, found in the unidentified Vienna material. I have not seen authentic specimens of this species, but feel certain that I have correctly determined these individuals. The species belongs to a difficult group. As here determined this is a rather strongly golden-brown pollinose species; the brown opaque frontalia distinct; face opaque; cheeks broader than width of third antennal segment and about one-third height of eyes. Mesonotum more shining; the gray markings discernible; dorsocentrals not very evident as distinct from the setulae. Halteres yellowish. Abdomen more shining, sparingly pollinose, bluish. Wings

short, distinctly brownish; white spots very pronounced but small; second vein paralleling costa and entering same rather abruptly, making the second and third sections almost equal in length; ultimate section of fourth vein short; fifth vein convex towards inferior margin; posterior crossvein distinctly oblique. Setulae of legs rather strong; tarsi black or brownish basally.

The specimens before me are labeled: "Heiligenblut, Carinthia, 6.8.21, Zerny," [3]; "Obladis, Tirolis, 14.7.88, Mik," [1].

Napaea mitis new species

Suggesting *pusilla* in general build but is slightly larger; the face has but one bristle each side, the wings showing noticeable infuscation along the veins.

Black; halteres brownish. Wings brownish, especially along the veins and at the crossveins; the latter with accompanying large whitish spots. The polliniferous vesture sparse so that the shining surface is discernible; brown on frons, thorax, and abdomen, more grayish on face and legs; the facial orbital areas more densely so; no bare areas on tibiae; mesopleura more opaque, brown. Anterior dorsocentral grayish marks very faint. Frontal vittae not very well marked, slightly more opaque, but the frons is almost uniformly subopaque.

Face oblique, not exceptionally prominent at epistoma, about as broad as long, slightly carinate medianly above; parafacials narrow, not broadening below. Cheeks narrow, not as broad as third antennal segment. Third antennal segment longer than broad; arista pubescent, thickened basally. The three posterior dorsocentrals scarcely longer than the setulae; prescutellars strong; 1 presutural, 1 supraalar, 2 notopleurals, and 1 mesopleural, discernible. Scutellum scarcely broader than long, rather semicircular, with no apical tubercle; apical bristles much closer together than their length. Abdomen longer than broad; second to fourth segments subequal in lengths; fifth longer (in type); lateral margins rather sharp. Legs normal. Third costal section of wings longer than second; no appendage on second vein; ultimate section of fourth slightly longer than preceding section; posterior crossvein erect. Length, 2 mm.

Type.—Male; Hammern, Upper Austria, August 11, 1877, (J. Mik), [A. N. S. P., no. 6362]. *Paratype.*—1 ♀; topotypical, August 23, 1872, (Mik), [Vienna].

Napaea pusilla (Meigen)

1830. *Ephydra pusilla* Meigen, Syst. Beschr., VI, p. 126.
1839. *Napaea pusilla* Haliday, Ann. Nat. Hist., III, p. 408.

Dr. Becker[16] selected the male in the Paris Museum as the type of this species. In the Vienna Collection I found a male bearing labels (1) "pusilla Coll. Winth." (2) "Ephydra pusilla" which is probably part of Meigen's original series and may be considered a paratype.

That collection also contained twelve specimens of this species correctly determined by Schiner and others; ten undetermined and incorrectly determined; also one determined by Frauenfeld which proved to belong to the genus *Hydrina*.

Napaea consors new species

This species is very similar to *fossarum* Haliday, from which it has very few differentiating characters. However, the following comparative diagnosis will serve to separate the two:

Slightly more densely yellow brown pollinose. Abdomen with revolute lateral margins in the males. Wings shorter and more brownish tinged; ultimate section of fourth vein shorter, not or but little longer than the preceding section.

Type.—Male; Ombla Tal, Dalmatia, May 23, 1923, (Zerny), [A. N. S. P., no. 6363]. *Paratypes*.—3 ♂, 1 ♀; topotypical. 1 ♀, labeled "Kruma, 6. VI. Alban. Exp. '18," seems to be conspecific with the above series.

Napaea nubecula (Becker)

1896. *Parydra nubecula* Becker, Berl. Ent. Zeit., XL, p. 212, pl. 6, f. 21.
1926. *Napaea nubecula* Becker, Linder, Fl. Pal. Reg., Fam. 56, p. 101, fig. 120.

A species allied to *fossarum* Hal., but much more densely pale brown pollinose; third antennal segment basally, sometimes entirely, brown to tawny; extremities of femora and entire tibiae ferruginous. Scutellum rather broad, convex, with sublateral bristles well towards base. The apical infuscation of the wings always present, but sometimes difficult to discern.

Among the undetermined Vienna material I found seven specimens of this species from Austria.

[16] Zeit. f. Hym. u. Dip., II, p. 313, (1902).

Napaea fossarum (Haliday)

1833. *Ephydra fossarum* Haliday, Ent. Mag., I, p. 175.
1839. *Napaea fossarum* Haliday, Ann. Nat. Hist., III, p. 407.

This species is very distinct from, but some individuals may be confused with the small ones of, *quadripunctata* Meig., especially the females. In the present species we have the face shorter and more prominent below; abdomen with sharp lateral margins; wings longer and more clear and not much wrinkled; second vein entering the costa rather acutely without appendage and rarely with infuscation.

The Vienna Collection contained thirty specimens, of which twenty-nine were correctly determined by Schiner and Becker. The other specimen proved to be *pusilla* Meigen. Among the undetermined material there were sixty-five specimens mostly from Austria, Hungary, Bosnia, Herzogovina, Dalmatia, Sicily and Tunis.

Halmapota salinaria (Bouche)

1834. *Ephydra salinaria* Bouche, Naturg. f. Ins., p. 99, pl. 6, fig. 13.
1856. *Halmapota salinaria* Haliday, Ins. Brit., III, p. 346.

I found eleven specimens under this name in the Vienna Collection, of which five proved to be *Ephydra riparia* Fallen.

Subfamily EPHYDRINAE

The species of this subfamily have the frontal bristles lateroclinate; the face produced on lower portion, with the mouth opening large and gaping; median area setulose and the facial series of bristles divergent with the orbits above, the two series often contiguous; anterior dorsocentrals generally present and well developed.

The following genera known to me fall in this group: *Teichomyza*, *Ephydra*, *Coenia*, *Philotelma*, *Scatella*, *Lamproscatella* and *Scatophila*.

Teichomyza fusca Macquart

1835. *Teichomyza fusca* Macquart, Hist. Nat. Ins., Dipt., II, p. 535.

In the Vienna Collection I found twenty-eight specimens under this name correctly identified, mostly from London, England, and Germany; also seven which proved to be *Ephydra riparia* Fallen. I also identify fifteen from "Frankfurt" and "Paris."

Ephydra riparia Fallen

1813. *Ephydra riparia* Fallen, Handl. K. Svenska Vet.-Akad., xxxiv, p. 246.
1830. *Ephydra albula* Meigen, Syst. Beschr., vi, p. 115. [syn. Stenhammar, 1844].
1860. *Ephydra riparia* Loew, Neue Beitr., vii, p. 35.

This is a common holarctic species, and the type-species of the genus. It also occurs in North America, there the typical form having been described as *milbrae* Jones, and the variety *macellaria*, as *subopaca* Loew.

The species was originally described from Sweden, and was, for a time, a composite, including *Ephydra micans* Loew, *Ephydra fumosa* Stenhammar, and probably other allied species of this or related genera. Loew was the first to limit it as here understood. In my own determination of the species I am influenced by the five specimens in the Vienna Collection bearing labels (1) "Suecia" (2) "riparia Coll. Wiedem." There is no record of who made these determinations, but Zetterstedt records the species from the more northern districts of Norway and from Swedish Lappland. I have not seen any specimens of the typical form from Central Europe, there being apparently replaced by intergrades with the variety *macellaria*. Typically the femora are entirely black and the tibiae ferruginous, not yellow, but the latter become paler in the more southern individuals, and in South Europe and North Africa we have the variety *macellaria* Egger with the legs entirely yellow. There are all intergradations between these two extremes.

Meigen in his work on the European Diptera described this species as *Ephydra albula* from three specimens in the Winthem Collection. In the Vienna Collection I found seven specimens bearing the Winthem labels "albula Coll. Winth." Of these I select a female, bearing an additional label in Meigen's? chirography "albula," as the TYPE. I cannot, however, consider any of the others paratypes.

In addition to the twelve specimens above mentioned, I also found in that collection thirty-four specimens determined as this species by Meigen, Frauenfeld, Schiner and others. Of these twelve proved to be *Ephydra micans* Loew. Under *macellaria* I also found forty-nine specimens from Austria, Turkestan, and Canary Islands, which I consider *riparia;* and among the unde-

termined material, seventy-nine, mostly from Austria, Hungary, Pollen, and Sicily.

var. **macellaria** Egger

1862. *Ephydra macellaria* Egger, Verh. Zool. Bot. Gesell. Wien, XII, p. 779.
1864. *Ephydra macellaria* Schiner, Faun. Austr., II, p. 262.
1896. *Ephydra macellaria* Becker, Berl. Ent. Zeit., XLI, p. 220.
1926. *Ephydra macellaria* Becker, Linder, Fl. Pal. Reg., Fam. 56, p. 75.

This was described, as a species, from Triest, the author separating it from *riparia* on its lighter color, metallic tinged femora and the relative lengths of the two discal sections of the fourth vein. In his specimens, the femora are dark with their extremities pale. Schiner redescribed this form (and there are specimens in the Vienna Collection determined by him), using the venation as the major differentiating character. Becker in 1896 questioned the specific value of this venational character, but stressed the almost total pale color of the legs, the sulcation of the mesofrons, the seriation of the acrostical setulae and the greater development of the sixth abdominal segment in the males. He later restricts the form (as a species) to individuals with entirely yellow legs, including the coxae.

As originally described, I do not think this can be distinguished from some minor varieties of the typical form, but there is, however, an extreme variation for which we may retain this name with propriety. In this the legs are entirely yellow, apparently correlated with a somewhat recessive development of their bristles. This variety, as with the typical form, shows the usual variation in the color of the face, from golden yellow to almost snow white, and general body color from olive yellow to grayish or bluish.

This variety seems to occur in southern palaearctic localities, but apparently more so in certain districts, probably due to some environmental influences. I retain Egger's name only for the extreme form, placing those individuals showing much discoloration of the femora in the typical series.

Of the sixty-five specimens in the Vienna Collection under this name, I retain only nine from Egypt, determined by Becker, and seven without locality, determined by Bergenstamm. In addition I found twenty-nine among the undetermined material in that collection and twenty-one in material kindly sent me by Dr. Walther Horn.

The following distributional record is gleaned from the material before me:

ALBANIA: Durazzo, (Karny), [Vienna, 28].

TUNIS: (Fischer), [Horn, 1].

EGYPT: Ab-del-Kari, January, (O. Simony), [Vienna, 4; det. Becker]. Jebel Samha, January, (O. Simony), [Vienna, 1; det. Becker]. Makálla, April, (O. Simony), [Vienna, 1; det. Becker]. Port Said, April, (O. Simony), [Vienna, 3; det. Becker].

IRAQ: Basra, May, (Schmidt), [Horn, 1].

TURKESTAN: Askabad, (Lichtwardt), [Horn, 20]. Merv-Oase, March, (Reitter), [Vienna, 1].

Locality not given: (Bergenstamm), [Vienna, 7; det. Bergenstamm].

Ephydra glauca Meigen

1830. *Ephydra glauca* Meigen, Syst. Beschr., VI, p. 120.

The type of this species in the Vienna Collection is a female labeled (1) "glauca Coll. Winth." (2) "glauca." The latter in Meigen's hand. This is the specimen mentioned by Becker[17] as a cinereous variety of *E. riparia* Fallen. It is in excellent condition and I have labeled it TYPE.

In considering this a distinct species I am influenced by the general ash gray color of the vesture; strong postorbital cilia; biserial arrangement of the acrostichals, and the elongate, pointed scutellum. The following diagnosis will serve to distinguish the species from *riparia.*

More robust than *riparia.* General color bluish gray, with mesofrons shining metallic green; mesonotum and scutellum more or less metallic green; a faint stripe on mesonotum, and the bases of abdominal segments, bronze color. Upper surface of thorax and trace on pleura, brown; face white in type. Postorbital cilia with three to four long bristles; two distinct acrostichal series of setulae with two or more pairs, bristle-like; prescutellars moderate, slightly diverging, but no prescutellar convexity present, nor tuft of hair on that area; two well developed presuturals. Scutellum distinctly triangular, flat, with narrow apex, and apical bristles closer together than their distance from lateral bristles.

Three females labeled "Lacu Sarak. Valachie. A. C. Montandon." [Vienna], are very similar to the type but the face is slightly more prominent; postorbital bristles stronger; aristal

[17] Zeit. Hym. u. Dipt., II, p. 311, (1902).

pectination more distinct; mesofrons with more rounded anterior margin, and the opaque vittae broader; mesonotum more densely pollinose. Another female labeled "Hdiyka Indus Phal. 1866"? is apparently conspecific with the type, but very dirty, with the face more strongly projecting and the acrosticals almost as strong as the dorsocentrals.

Ephydra pectinata Cresson occurring in North America is a related species.

SETACERA new genus

I erect this genus for those species heretofore placed in *Ephydra*, having a long hair arising from the lateral surface of the third antennal segment. In addition, the known species have the frontal orbits shining, metallic tinged, with two frontorbital bristles; face very prominent, with that portion above the bristles metallic colored concolorous with frons, that portion between the foveae flattened. Legs more slender, especially middle femora apically.

GENOTYPE: *Setacera pacifica* as (*Ephydra pacifica* Cresson, 1925).

Besides the following species this genus also includes *Ephydra atrovirens* Loew, of North America.

Setacera micans (Haliday)

1833. *Ephydra micans* Haliday, Ent. Mag., I, p. 175.
1860. *Ephydra micans* Loew, Neue Beitr., VII, p. 36.
1830. *Ephydra riparia* Meigen, Syst. Beschr., VI, p. 117. [not Fallen, (1813); syn. Loew, 1860].

We must recognize this species mainly upon Loew's identification. It is considered to be Fallen's *Ephydra riparia* var. *b*, and is what Meigen described as *riparia*.

The species has two well developed presutural bristles present; the genitalia of male turgid, without median groove; tibiae ferruginous basally, darkening apically, sometimes scarcely diluted basally or again quite pale, the apical darkening not sharply delimited. The middle of tibiae of male distinctly ciliated beneath with short, erect, evenly spaced setulae.

The Vienna Collection contained eleven specimens under this specific name, determined by Schiner, of which ten proved to be correctly determined. The other one, a male, probably represents a distinct species. Besides the above, I found twelve specimens

under *Ephydra riparia* labeled as follows: five "riparia Coll. Winth." (probably part of the series upon which Meigen based his description of *riparia*), two "riparia Alte Sammlung," two "riparia det. Bergens.," and three "riparia Coll. Wiedem."; also three under *breviventris* determined by Schiner, and four among the undetermined material.

Setacera pedalis new species

This form, which I have given specific rank, is so similar to *breviventris* that it may ultimately prove to be merely a variety. As compared with *breviventris* we have the frons slightly rougher, and more brilliant blue, the black vittae very narrow, almost indistinguishable; cheeks slightly narrower; aristal pectinations more erect (in *breviventris* these appear almost wanting). Mesopleura more grayish, contrasting with the brownish mesonotum. Abdomen with a more noticeable brownish tinge on dorsum. Distal two-fifths of tibiae dark, the proximal three-fifths yellow, the limits sharply defined; distal portion of femora more extensively yellowish. There may be good genitalic characteristics, but my series does offer conditions for critical examination. Length, 3 mm.

Type.—Male; Vienna, Austria, September, 1868, (Mik), [A. N. S. P., no. 6372]. *Paratypes.*—2 ♂, 9 ♀; Austria. "Alte Sammlung, breviventris det. Schiner." [Vienna Collection].

Setacera breviventris (Loew)

1860. *Ephydra breviventris* Loew, Neue Beitr., VII, p. 37.

Of the eighteen specimens in the Vienna Collection under this specific name, determined by Schiner, I found but one perfect and one without head, which I consider this species. Of the others, three proved to be *micans*, two *E. riparia*, and eleven, my new species here described.

This species Loew described as differing from *micans* in the broader, ovate abdomen; light, shining blue on the dorsum, yellowish brown and more opaque laterally; fifth segment of male slightly shorter than fourth; hypopygium flat or slightly turgid with distinct median groove. Legs blackish in ground color. In agreement with this diagnosis, I have before me what seem to be two closely allied but certainly distinct forms, and I am influenced

by Loew's description of the abdomen and leg coloration in the determination of his species. The following diagnosis will serve to distinguish the present species:

Very similar to *micans* but smaller, one well developed and often another weaker, presutural bristle; middle tibiae of male with, at most, very minute flexor ciliation. Abdomen ovate; hypopygium large with distinct median groove, deeply and widely cleft apically, the apical appendages with lamellate tips. Legs as in *micans*. The females are separated from those of *micans* by the smaller size and the absence of, or weakly developed, second presutural bristle.

Besides the above mentioned series, I found two more specimens of this species among the undetermined Vienna material.

Coenia fumosa (Stenhammar)

1844. *Ephydra fumosa* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 171.

1860. *Caenia fumosa* Loew, Neue Beitr., VII, p. 38.

This is acknowledged to be Fallen's *Ephydra riparia* var. *c*, and is easily distinguished from *palustris* and *curvicauda* by the metallic bronze and bluish banded abdomen.

In the Vienna Collection there were forty-one specimens of the species correctly determined by Frauenfeld, Schiner and others, and among the undetermined material I found forty more specimens, mostly from Austria.

Coenia beckeri Kuntze

1897. *Caenia beckeri* Kuntze, Deut. Ent. Zeit., 1897, p. 154.

This species is easily distinguished by its large size and bluish gray appearance. It is recorded, apparently, only from the white sulphur springs near Rome, Italy.

Of this species I found four specimens in the Vienna Collection labeled "Roma 5.96," on reverse "A. Kuntze Dresden." In the undetermined material there were three specimens labeled "Italia Rom Acquae albule," on reverse "A. Kuntze." All these specimens are probably part of the original series collected by Kuntze at the spring near Rome in 1895 and 1896. They are, at least, topotypes.

Coenia palustris (Fallen)

1823. *Ephydra palustris* Fallen, Faun. Suec., Hyd., p. 4.
1830. *Ephydra palustris* Meigen, Syst. Beschr., VI, p. 115.
1835. *Coenia palustris* Macquart, Hist. Nat. Ins. Dipt., II, p. 214.

This is the genotype of *Coenia* and is separated from the other species, excepting *curvicauda*, by the general shining black appearance. Its separation from *curvicauda* is discussed under that species.

Of this species there were five males and five females in the Vienna Collection determined by Schiner and Egger, and among the undetermined material I found two specimens from Austria and Hungary.

Coenia curvicauda (Meigen)

1830. *Ephydra curvicauda* Meigen, Syst. Beschr., VI, p. 116.
1835. *Coenia curvicauda* Macquart, Hist. Nat. Ins. Dipt., II, p. 530.
1911. *Caenia curvicauda* Collins, Ent. Mo. Mag., 1911, p. 187.

Collins considers *curvicauda* Meigen specifically distinct from *palustris* Fallen on account of its black halteres and the large turgid hypopygium. He therefore considers that *palustris* has these appendages pale and the hypopygium small. These characters I cannot glean from the original description by Fallen, but Meigen specifically described the halteres white in what he considered *palustris* and it will simplify the situation if we follow this interpretation.

In the Vienna Collection I found two males bearing the "Coll. Winth." labels; and one of these labeled (1) "curvicauda Coll. Winth." (2) "curvicauda," I selected and labeled the TYPE, the other, Paratype.

The series of both species before me show very few specific characteristics with the exception of the development of the hypopygium in the males, which, in the present species, consists of a large anal segment, about one-half the length, and extended beneath towards the base, of the abdomen, often with the genital apparatus exerted in form of a slender prong extending backward towards apex of the abdomen, about one-half the length of the anal segment. This latter condition is markedly represented in the typical series. The abdomen is more or less turgid apically to accommodate this genitalic development,

especially when not exerted. In *palustris* this anal segment is comparatively small and without the greatly developed genital apparatus, which latter is not exerted (at least in the series I have examined). The two species are, therefore, comparatively easy to separate as to the males. The females on the other hand are difficult, but I have been able to find a few characteristics, in the small series at hand, which seem to hold in both sexes. *Curvicauda* is slightly more robust than *palustris;* more shining and consequently appearing more intensely black. Head in profile somewhat longer in relation to its height, causing the eyes to become more oblique; the face is also more produced; frons more polished, longer as to its width on account of not being so much depressed at the antennae; thus the line of the anterior orbital bristle in profile appears to be far above that of the lunular margin of the frons.

No doubt more intensive study of a larger series of both species will result in the discovery of other, probably more positive characteristics. I cannot correlate the color of the halteres. In *palustris* they appear paler, but there are apparently all intergrades to blackish, although not a decided black in *curvicauda*.

Whether or not Fallen describes *palustris* as here recognized cannot, with certainty, be determined, but we know what *curvicauda* is, and can comfortably use Fallen's name for the other species.

In addition to the above mentioned type series, I found specimens of this species among the undetermined material in the Vienna Collection from Usedom, Germany; Frain, Moravia; and St. Georgen, Hungary. This species also occurs in North America.

Philotelma nigripennis (Meigen)

1830. *Notiphila nigripennis* Meigen, Syst. Beschr., VI, p. 175.
1896. *Philotelma anomala* Becker, Berl. Ent. Zeit., XLI, p. 164. [syn. Becker, 1905].
1902. *Pseudoscatella nigripennis* Becker, Zeit. Hym. u. Dipt., II, p. 298.
1905. *Philotelma nigripennis* Becker, Katal. Pal. Dipt., IV, p. 196.

The genus *Philotelma* is very similar to *Scatella* in general, but the arista is long haired above in the former; the wings are immaculate, and although similar to *Coenia* in these respects, *Philotelma* has only two posterior dorsocentrals and the buccal

bristle is wanting. The present species is shining black with scarcely any dusting.

Becker (1902) records the type in the Vienna Collection and proposed a new genus for its reception, not being aware that he had previously (1896) erected a genus for the same species which he described as *anomala*. It is curious that he did not recognize this synonymy until 1905.

In the Vienna Collection I found two males; one labeled (1) "nigripennis Coll. Winth." (2) "nigripennis," which I label "TYPE, Notiphila nigripennis Meigen." The other bearing a similar label (1) I consider a paratype.

Scatella stagnalis (Fallen)

1813. *Ephydra stagnalis* Fallen, Handl. K. Svenska Vet.-Akad., xxxiv, p. 248.
1849. *Scatella stagnalis* Walker, List Dipt. Br. Mus., iv, p. 1104.
1830. *Scatella buccata* Robineau-Desvoidy, Myod., p. 801. (syn. Haliday, 1856).

This is the genotype of *Scatella*, and is one of the most common of its species, in collections. It is readily distinguished by the absence of, or rudimentary condition of, the anterior dorsocentral, but with a well developed sutural pair of acrostichals; four spotted wings with normal costa, and brown to ochreous face.

Ephydra lutosa Haliday may easily be confused with this species, and care should be maintained in determining the smaller and paler individuals of *stagnalis*. I have endeavored to state, under *lutosa*, the best characters for its separation. *Stagnalis*, typically, is larger and darker than *lutosa*, but with scarcely any other definite structural differentiation. Fallen's descriptions do not give us any definite characters upon which we can establish his species. Haliday[18] uses *Scatella buccata* instead of *stagnalis*, stating that "Fallen has probably confounded with his *E. stagnalis* all the species with hyaline dots on the dark ground of the wings, and although Meigen has very fully distinguished many species of this character, I can scarcely identify any of mine exactly with his descriptions." I am considering Wiedemann's and Meigen's determinations in the Vienna Collection as bases on which to definitely establish this species. In this collection there are two males and one female labeled (1)

[18] Ann. Nat. Hist., iii, p. 409, (1839).

"Kiel" (2) "stagnalis Coll. Wiedem.," three males and seven females labeled (1) "stagnalis Coll. Winth.," one of the latter males also bearing a handwritten label, probably Meigen's, "Ephydra stagnalis ♂." These I am considering typical specimens of this species. There is another female labeled (1) "stagnalis Coll. Winth." (2) "Ephydra stagnalis ♀," which is also probably typical, but it is in poor condition.

Of the forty-six specimens in the Vienna Collection under this name I consider thirty-eight, including the above mentioned specimens determined by Wiedemann and Meigen, correctly determined by Schiner, Frauenfeld, Bergenstamm and Becker. Of the remaining eight, five proved to belong to *Scatophila*, two to *Lamproscatella*, and one, a species of *Napaea*. Among the undetermined material in the same collection I find eighty-eight specimens mostly from Austria, Bohemia, Bosnia, Tirols, Styria, Sicily, Albania, Germany, and Greenland. Also there were ten specimens determined as *silacea* by Schiner.

Scatella lutosa (Haliday)

1833. *Ephydra lutosa* Haliday, Ent. Mag., I, p. 176.
1839. *Scatella lutosa* Haliday, Ann. Nat. Hist., III, p. 409.

This species is structurally similar to *stagnalis* but smaller and somewhat lighter in color; the whitish wing spots generally larger; the setulose area of the face shorter in proportion to its length, with correspondingly less number of setulae; the oral cilia not stronger than the facial bristles. There is noticeably more gray on the pleura in contrast with the mesonotum; base of wings, the margin, and the cilia, of squamae, yellowish; tarsi often noticeably paler than the tibiae.

The smaller size (3 to 3.5 mm.; 2.5 mm., of Haliday) in comparison with *stagnalis* is noteworthy, which, correlated with the paler tarsi and the five spotted wings, convinces me of the correctness of my determination. Its separation from that species is, however, not always easy. The small individuals of *stagnalis* and some of the dark ones of *lutosa* are difficult to determine.

Scatella lutosa var. *nigripes* Oldenberg[19] is, apparently, a form of *lutosa* having the tarsi black, but is probably nothing more than a smaller form of *stagnalis*.

[19] Deut. Ent. Zeit., 1923, 315.

In the Vienna Collection I found four specimens under this name of which three were correctly determined. In the undetermined material there were 108 specimens mostly from Austria, Germany, Holland, and Sicily.

Scatella sancti-pauli Schiner

1868. *Scatella sancti pauli* Schiner, Reise Novara, Zool., II, p. 243.

This species was described from five specimens collected on Saint Paul Island in the Indian Ocean. In the Vienna Collection there are three females labeled (1) "Novara R. St. Paul" (2) "Sancti Pauli Alte Sammlung." I have selected the best preserved specimen for the TYPE and so labeled it. This individual is, however, somewhat paler than the others but the appendages, bristles and wings are in better condition.

The species belongs to the *stagnalis*-group and may be distinguished by the unusually long and slender hind tibiae, which are as long or longer than their femora; the general ground color is brownish, with face grayish. There are no anterior dorsocentrals but the sutural acrosticals are strong.

Scatella callosicosta Bezzi

1895. *Scatella callosicosta* Bezzi, Bol. Soc. Ent. Ital., XXVII, p. 70.

This species has the general characteristics of *stagnalis* but the color is yellow ochre; the wing spots faint, and in the male the first costal section is calloused, occupying more than one-half the width of the costal cell. The females may probably be confused with some yellowish individuals of *stagnalis*.

I have seen but one specimen, a male, of this species, which was given to me by the late Dr. Bezzi, collected at Catalina in 1892, and is probably a paratype, or at least a topotype.

Scatella paludum (Meigen)

1830. *Ephydra paludum* Meigen, Syst. Beschr., VI, p. 118.
1830. *Ephydra leucostoma* Meigen, Syst. Beschr., VI, p. 121. [syn. Becker, 1902].
1839. *Scatella paludum* Haliday, Ann. Nat. Hist., III, p. 410.

A species easily recognized by its silvery white face and its rather shining mesonotum with grayish margins.

The type in the Vienna Collection is a female labeled (1) "paludum Coll. Winth." (2) "paludum," and I have so labeled it.

Under *Psilopa leucostoma* Meigen, I found four males and one female of this species which proved to be the types of *Ephydra leucostoma* Meigen, which was described from the Winthem Collection. I have selected a male bearing label "leucostoma Coll. Winth." as the type and it is so labeled. The other four are considered paratypes. Under this name in the above collection I also found thirty-three specimens correctly determined by Schiner, Bergenstamm, and Becker; also among the undetermined material there were two hundred and four specimens mostly from Austria, Sicily, Germany, Holland and Egypt.

Scatella silacea Loew

1860. *Scatella silacea* Loew, Neue Beitr., VII, p. 41.

This species has four spots in the wings, and strong anterior dorsocentrals, as well as the usual pair of strong acrostichal sutural pair, but no posterior acrostichals. The gray of the abdomen strongly contrasts with the yellow ochre of the head and thorax, and the third antennal segment is inclined to become pale.

I have seen only five specimens of the species, two of which I found in the Vienna Collection under *stagnalis* labeled "stagnalis Coll. Winth." The eleven specimens I found under this name determined by Schiner proved to be *stagnalis*.

Scatella subguttata (Meigen)

1830. *Ephydra subguttata* Meigen, Syst. Beschr., VI, p. 120.
1903. *Scatella subguttata* Becker, Mitt. Zool. Mus. Berl., II, p. 176.

This is a mottled yellow ochre and white species with distinct posterior acrosticals and rather well developed anterior dorsocentrals. The submarginal cell spot is large and quadrate.

The type in the Vienna Collection is a male, lacking the third antennal segment, labeled (1) "subguttata Coll. Winth." (2) "subguttata." With the type, but labeled "aestuans det. Schiner," I found nine specimens which proved to be *stagnalis;* and one with the thorax incomplete, which I was unable to determine. Among the undetermined material there were thirty-seven specimens of this species from Austria, Sicily and "Dorpat."

LAMPROSCATELLA Hendel

Dr. Hendel proposed this genus for the reception of those species allied to *Ephydra sibilans* Haliday; characterized by the presence of anterior dorsocentrals and the absence of the diluted wing spots, the wings being almost hyaline; thus distinguishing them from those species allied to *E. stagnalis* Fallen, constituting the genus *Scatella*. Becker (1926) considered *Lamproscatella* a subgenus of *Scatella*, and I rather approve of this treatment, but in the present paper I am keeping it distinct.

The above characterization, however, will not hold in all cases as regards the American species known to me, but I will not here attempt to give any definite diagnosis of this group except to add that, typically, the strong upcurved facial bristle so characteristic of *Scatella* is here removed from the oral margin and more in line with those of the facial series; the acrostical series are uniform and complete to the base of scutellum without the strong sutural pair as in *Scatella*. These characteristics will serve for the present to distinguish this genus.

Lamproscatella dichaeta (Loew)

1860. *Scatella dichaeta* Loew, Neue Beitr., VII, p. 40.
1926. *Lamproscatella dichaeta* Becker, Linder, Fl. Pal. Reg., Fam. 56, p. 85.

This is not a typical species but is no doubt congeneric with *sibilans*. It is more slender and of a general whitish color, with somewhat metallic green mesofrons, and some brown on the mesonotum. The upcurved facial bristle is prominent and situated near the oral margin as in *Scatella*.

In the Vienna Collection I found ninety-eight specimens of this species from Austria and Hungary.

Lamproscatella sibilans (Haliday)

1833. *Ephydra sibilans* Haliday, Ent. Mag., I, p. 175.
1917. *Lamproscatella sibilans* Hendel, Deut. Ent. Zeit., 1917, p. 42.

In this species we have the color generally olive to brown above, becoming grayish below; the face not broader than long, inclining to ochre or grayish; frons scarcely broader than long with mesofrons opaque.

In the Vienna Collection I found fifty-five specimens of this species mostly from Austria, Bohemia.

Lamproscatella faeroensis (Becker)

1915. *Scatella faeroensis* Becker, Zool. Jahrb. Syst., XXXIX, p. 132.
1926. *Lamproscatella faeroensis* Becker, Linder, Fl. Pal. Reg., Fam. 56, p. 85.

This species is very similar to *sibilans* judging from the two females before me from Faroe Islands, (Rosen), in the Vienna Collection determined by Becker, and in all probability it will prove to be a synonym, or at most a variety or subspecies, of *sibilans*. The frons and face are broader, much broader than long; and the head, in profile longer than high, made so by the more prominently protruding face. Otherwise I see no differentiation which seems to be of specific value.

Lamproscatella quadrisetosa (Becker)

1896. *Scatella quadrisetosa* Becker, Berl. Ent. Zeit., XLI, p. 229, pl. 4, fig. 26.
1926. *Lamproscatella quadrisetosa* Becker, Linder, Fl. Pal. Reg., Fam. 56, p. 85, fig. 95.

This species was originally described from Norway. Cole [20] reports it from Pribilof Islands, Alaska, but as I have not seen any specimens of Cole's series, I cannot confirm his record. He may have had what Malloch later[21] described as *Scatella brunnipennis*, paratypes of which I have seen and which are not conspecific with the three specimens at present before me from Greenland determined by some one as *quadrisetosa* Becker.

The species as here recognized is readily distinguished by the shining mesofrons.

EUSTIGOPTERA new genus

This genus is proposed for the reception of those species heretofore included in *Scatella* having definite maculation in the marginal cell, and the costa attaining the fourth vein. The face is shorter than in *Scatella* and more oblique with correspondingly less number of setulae and bristles; frons with one laterally curved frontorbital; no anterior dorsocentral; abdomen polished black, in the known species, in contrast with the opaque thorax.

GENOTYPE: *Eustigoptera quadrata* (*Notiphila quadrata* Fallen, 1813).

[20] Proc. Cal. Acad. Sci., XI, p. 176, (1921).
[21] No. Am. Fauna, No. 46, p. 221, (1923).

Eustigoptera quadrata (Fallen)

1813. *Notiphila quadrata* Fallen, Handl. K. Svenska Vet.-Akad., xxxiv, p. 255.
1830. *Ephydra quadrata* Meigen, Syst. Beschr., vi, p. 119.
1839. *Scatella quadrata* Haliday, Ann. Nat. Hist., iii, p. 410.

This species is recognized by the two triangular or rounded brown spots in the first posterior cell along the third vein which are more intense than are the remaining infuscated spots in the cell. The marginal cell has four or more infuscated spots.

We can feel satisfied that this is Fallen's species, as distinct from the closely allied and more recently described *pauciguttata* Strobl. Fallen's description of the abdomen and wings is in agreement, and Meigen also understood the species as is evident by the four specimens in the Vienna Collection labeled "quadrata Coll. Winth."

In addition to the above mentioned specimens I found four more labeled "quadrata Coll. Wiedem." of which three proved to be *pauciguttata;* also seven specimens correctly determined by Frauenfeld, Schiner and others; and among the undetermined material I found seven from Austria and Sicily.

Eustigoptera pauciguttata (Strobl)

1910. *Scatella pauciguttata* Strobl, Mitt. Nat. Ver. Steyerm., xlvi, p. 208.

This species is easily confused with *quadrata,* but the wings are shorter, the markings much reduced in number, there being only three infuscated spots on the marginal cell which are opposite those in the submarginal, forming short bands between and contiguous with the costa and third vein. No conspicuous spots in the first posterior cell along the third vein although there are spots present which, however, occupy the entire width of the cell, and there is usually a rounded isolated spot in the second posterior cell.

Besides the three specimens determined by Wiedemann as *quadrata* in the Vienna Collection, I found two more of this species among the undetermined material.

Eustigoptera stenhammari (Zetterstedt)

1846. *Ephydra stenhammari* Zetterstedt, Dipt. Scand., v, p. 1842:
1860. *Scatella stenhammari* Loew, Neue Beitr., VII, p. 40.

Another species very similar to *quadrata*, but the wing is rather infuscated, variegated with numerous hyaline spots. There are no conspicuous spots along the third vein as in *quadrata*, but the three infuscated areas or spots in that cell give a similar pattern. The tarsi are black.

Becker, in his most recent work on this family,[22] cites Meigen's determination of *quadrata* as synonymous with the present species, but I think he was in error as I mentioned under that species. Meigen's specimens are correctly determined.

I did not find any specimens of this species in the Vienna Collection but have received an European specimen from another source. The species also occurs in North America.

SCATOPHILA Becker

The type of this genus is *Ephydra caviceps* Stenhammar (1844), which is not, in my opinion, synonymous with *Ephydra quadriguttata* Meigen (1830).

The species of the genus have the costa extending to or slightly beyond the third vein, never reaching the fourth; only one laterally inclined frontorbital; the facial bristles limited to a median pair and one at lower angle, all of which may be wanting especially in the males of some species; the oral cilia are above, not at, the oral margin. The mesonotum is generally brown with gray markings, in form of longitudinal stripes and irregular spots; all of which may, in some species, coalesce and expand so that the brown is totally, or almost, obliterated. All intergradations occur, and one should be careful in placing too much stress on this plastic character for specific separation.

The concaved condition of the face in the males of some species has been used as a specific character for both sexes. This practice of Loew and Becker naturally leads to erroneous conclusions and possible synonymy.

The European material before me is rather lacking in variety of forms and consequently I am unable to offer much towards satisfactorily establishing the Palaearctic species; nor can I

[22] Linder, Fl. Pal. Reg., Fam. 56, p. 82, (1926).

depend much upon the works of Becker, nor upon the determinations of previous students, but must glean from original descriptions where the examination of types is not possible. The latter, however, must be done before we can properly understand the species of this genus.

Scatophila despecta (Haliday)

1839. *Scatella despecta* Haliday, Ann. Nat. Hist., III, p. 409.
1860. *Scatella despecta* Loew, Neue Beitr., VII, p. 43.
1896. *Scatophila despecta* Becker, Berl. Ent. Zeit., XLI, p. 241, pl. 5, fig. 12.

This species is distinguished by the Scatella-like, upcurved bristle at the lower facial angles.

We must follow Loew and Becker in recognizing this species, which is, besides *Scatophila hamifera* Becker,[23] the only known species of the genus with this characteristic facial bristle. I have not seen *hamifera*, which may prove to be only a variety of the present species.

Here we have apparently the most common species of the genus; at least it is so in collections. I found fifty-five specimens in the Vienna unidentified material from Austria.

Scatophila cribrata (Stenhammar)

1844. *Ephydra cribrata* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 269.
1896. *Scatophila cribrata* Becker, Berl. Ent. Zeit., XLI, p. 240.

This species is similar to *caviceps* Stenhammar in the mesonotal markings, but is of a more general darker color, with black halteres and tarsi. The face of the male is convex with the usual pair of median facial bristles.

I found but one specimen of this species in the Vienna Collection. It is a female bearing a label "Dorpat."

I have also seen material of what appears to be this species from Greenland.

Scatophila laevigata (Loew)

1860. *Scatella laevigata* Loew, Neue Beitr., VII, p. 44.
1896. *Scatophila laevigata* Becker, Berl. Ent. Zeit., XLI, p. 243.

A female in the Vienna Collection labeled (1) "noctula Coll. Winth." (2) "noctula" is probably, as Becker states,[24] this species,

[23] Berl. Ent. Zeit., XLI, p. 242, (1896).
[24] Zeit. Hym. u. Dipt., II, p. 310, (1902).

but the thorax is so discolored that the markings are indistinguishable. That it is *noctula* Meigen[25] is also probable, but as it does not agree with Meigen's original description, we cannot consider it in this respect.

This species has very narrow cheeks; a distinct interacrostichal gray line, especially discernible posteriorly; and the abdomen is polished black.

Besides the above mentioned specimen, I found another female of this species labeled "4-guttata Coll. Winth."

Scatophila quadriguttata (Meigen) new comb.

1830. *Ephydra quadriguttata* Meigen, Syst. Beschr., VI, p. 120.
1839. *Scatella quadriguttata* Haliday, Ann. Nat. Hist., III, p. 410.

I cannot ignore Meigen's name for this species upon Becker's argument.[26] It may, however, prove to be a form or variety of *caviceps* Stenhammar. The error in Meigen's description of the number of wing spots is easily explained, and is not inexcusable in view of the comparative crude accessories with which the early students had to work. Rather it is to be considered extraordinary that such minute details as are sometimes described were preceived by these students. We can and should allow for considerable discrepancies in the early descriptions of these small insects.

Of the known European species having the face of the male concaved or flattened, the present one may be distinguished by the whitish scutellum and mesonotum, the latter with a median brown stripe before the suture, slightly broader than space occupied by the acrosticals, and expanding posteriorly to include the dorsocentrals. This is the condition in which the narrow anterior and posterior gray stripes of the typical pattern are expanded, coalescing and occupying the greater portion of the lateral mesonotal surface, leaving the intradorsocentral region brown. The wings generally have more or less distinct apical diluted spots in the submarginal and first posterior cells. It is unnecessary to further amplify the specific characteristics here, except to state that these mesonotal and scutellar characters are present in both sexes.

In the Vienna Collection I found a male and three females

[25] Syst. Beschr., VI, p. 119, (1830).

[26] Zeit. Hym. u. Dipt., II, p. 311, (1902), and Lind. Fl. Pal. Reg., Fam. 56, p. 87, (1926).

labeled "4-guttata Coll. Winth.," of which I selected and so labeled the male as the type, which also bears a second (handwritten) label "4-guttata." The other specimens I labeled paratypes, although one of them proved to be *Scatella laevigata* Loew.

Besides the above, I found among the undetermined material in the same collection, six specimens of this species, mostly from Austria, Germany, and Sicily, and two which were found under, and determined by Schiner as, *cribrata*.

Scatophila caviceps (Stenhammar)

1844. *Ephydra caviceps* Stenhammar, Handl. K. Svenska Vet.-Akad., 1843, p. 270.

1896. *Scatophila caviceps* Becker, Berl. Ent. Zeit., XLI, p. 241, pl. 6, fig. 35.

This is the genotype of *Scatophila* and may prove to be synonymous with *Ephydra quadriguttata* Meigen (1830).

Stenhammar's original description states that the face is concaved, and the mesonotal markings consisting of narrow dorsal lines almost as in *cribrata*, he describes as "two short anterior narrow white lines . . . and an abbreviated lateral one on each side posteriorly" (translation). Here we have the mesonotum brown with two narrow presutural gray stripes between the acrostichal and dorsocentral series, and a narrow postsutural stripe laterad of the posterior-dorsocentrals and ending just before the second dorsocentral. The scutellum is brown, with or without basal and apical median gray spots. Mesopleura with a more or less broad, horizontal, median gray bar attaining the posterior margin, often expanding, leaving only an upper and a lower spot of brown.

In other respects I can see very little to differentiate this species from *quadriguttata*, but the series of both these forms, before me, are limited, and although there is a strong tendency in some specimens to intergrade in the matter of the mesonotal markings, I do not care to consider them synonymous at this writing.

In the Vienna Collection and their undetermined material I found fifteen specimens of this form: One male correctly determined, one male and three females under and determined as *stagnalis*, one female determined as *cribrata* and nine undetermined, from Usedom, Germany; Hammern and Vienna, Austria and Sicily.

SHORT STUDIES IN AMERICAN HESPERIIDAE

(LEPIDOPTERA: RHOPALOCERA)

BY R. C. WILLIAMS, JR., AND E. L. BELL

I. On Pyrgus syrictus Fabricius and orcus Cramer

Syrichtus Fabricius[1] is very closely approached in superficial appearance by the insect described by Cramer as *orcus*,[2] which has been generally placed by authors as a synonym of *syrichtus*.

The possibility of the two being distinct from each other has been suggested from time to time; Barnes and Lindsey[3] call attention to the paper by Dr. Reverdin,[4] in which he describes *fumosa* as a new form of *syrichtus*, and gives the name *syrichtides* to the insect described by Cramer as *orcus*. In this paper they definitely fix *montivagus* Reakirt as the form of *syrichtus* which has the under surface of the secondaries suffused with brown, and *fumosa* Reverdin as a synonym of *montivagus;* they also indicate their belief that *orcus* is distinct from *syrichtus*. Skinner and Williams[5] also indicate that *syrichtus* and *syrichtides* may be distinct species.

Barnes and Lindsey mention, in the paper above referred to, that Butler[6] applies the Fabrician name to specimens from Honduras, and that Capt. N. D. Riley, of the British Museum, had written them that in the series of that Museum, the North American insect is represented by specimens from Mexico to Costa Rica; and the other insect from Panama and South America. Capt. Riley has sent us a list of the specimens in the British Museum, and our examination of the long series in the collections of the Academy of Natural Sciences, Philadelphia, American Museum of Natural History, New York City, and the Bell collection, largely bears out this distribution, extending it to

[1] Syst. Ent., p. 534, (1775).
[2] Pap. Exot., IV, p. 87; p. 334, fig. I, (1782).
[3] Ent. News, XXXII, pp. 78–79, (1921).
[4] Bull. Soc. Lep. Geneve, IV, pp. 96–107, (1919).
[5] Trans. Amer. Ent. Soc., XLVIII, pp. 287–288, (1922).
[6] Cat. Fabr. Diurn. Lepid., Br. Mus., p. 280, (1869).

Salvador for *orcus*, and to the West Indies where the two species apparently do not occur together on any one island, *syrichtus* being confined to the islands north of Dominica, and *orcus* to Dominica and the islands south of it. It will be seen from the accompanying records of the distribution, that on the mainland *syrichtus* is principally found in the region north of Costa Rica, and *orcus* south of that country, the two species overlapping there and at least as far as Salvador, though from the very few records of *orcus* in this region and the many records of *syrichtus*, it would seem that *orcus* is not of very common occurrence.

The two species are separable on at least one superficial character and the form of the male genitalia. The superficial character is found on the under side of the secondaries, in the space above the costal vein. In all specimens examined, *syrichtus* has four dark spots in this space, as follows: the first at the base, the second a little beyond it, the third about the center, and the fourth at the extreme end; whenever one of these spots may be absent, it is never the third one, though that spot on very rare occasions may be reduced; *orcus* always lacks the third spot, and the fourth usually does not enter the space, but is just outside of it at the outer angle. The valvae of the male genitalia of *syrichtus* terminate in a broad, evenly rounded apex, the dorsal edge produced backward and inward in a curve and strongly dentate; at about two-thirds the length from the base there is a lobe projecting inwardly from the ventral edge and furnished with several strong spines. The valvae of *orcus* are not evenly rounded at the apex, but project somewhat, or are produced into a substantial lobe, as Skinner and Williams have aptly put it "like the toe of a slipper"; the dorsal edge is not produced so far backward and curved inward, as in *syrictus;* the lobe of the ventral edge is lacking, but there are some strong spines projecting inwardly at about the center.

Of the two forms of the valvae of *orcus* illustrated, figure 3 is the common one; the second form, figure 4, is known to us only from Tarap, Peru, as recorded by Reverdin, and from our own Ecuador material. We have not found any connecting forms.

The records of the distribution of the two species are taken from collections previously mentioned which are abbreviated as follows: [Ac.] = Academy of Natural Sciences of Philadelphia; [Am.] = American Museum of Natural History, New York; [Br.] = British Museum; [B.] = E. L. Bell collection.

Pyrgus syrichtus Fabricius

The following records include those of the typical form and form *montivagus* Reakirt = *fumosa* Reverdin.

UNITED STATES OF NORTH AMERICA.

FLORIDA: Key West, (Morrison), [Ac.]; (Lutz, Schwarz), [Am.]. Tampa, October 19, (Engelhardt); Royal Palm State Park, March 24, (Morgan); [B.].

TEXAS: Corpus Christi (Aaron); San Antonio; Brownsville; San Benito, July 16 to 23, [Ac.]. Brownsville, January 15, February 14 to 25, April 12 to 20, May 7 to 14, November 5 to 14, (Piazza, Ellis, Doll, Engelhardt); Corpus Christi, April 5, (Engelhardt); [B.].

ARIZONA: (Morrison), [Ac.].

MEXICO. Esquintla, Chiapas, January, April, June, (White); Ocotlan, Oaxaca, November, (White); Uruapam; Colima; Ocotlan, Jalisco, 5000 feet elev., August 29, (Calvert); Vera Cruz, November 28, (Williams); Texola, Vera Cruz, March; Yucatan, (Gaumer); [Ac.]. [Br.]. Jalapa, May 27; Coatepec, May 20 to June 25, (Fulda); Manzanillo, May 27; Colima, May 9; Iguala, October, November; [B.].

CENTRAL AMERICA.

GUATEMALA: Gualan, January 14, 17, [Ac.]. Quirigua; [Br.]. Morales, March, November, (White), [B.].

HONDURAS: San Pedro Sula, November, (Lienhart), [Ac.]. [Br.].

SALVADOR: [Br.].

NICARAGUA: [Br.].

COSTA RICA: [Br.]. El Libano, Guanacaste, 2000 feet elev., (Gillott); Cartago, 4500 feet elev., (Gillott); May 14, (Calvert); Puntarenas; San Juan, 2500 feet elev., (Gillott); [Ac.]. Orotina, July 18, (Smith); [B.].

WEST INDIES.

CUBA: (Brown, Forbes, Huntington); [Am.]. [Br.]. Havana, January 12, (Williams); Guantanamo, February 11, (Skinner); Sierra Madre Mountains, 2500 feet elev., November 2 to 30, December 1 to 31, January 1 to 29, (Querci); [Ac.]. Santiago, August; Cobra, August 22, (Fulda); Guantanamo, July 15; [B.].

PORTO RICO: (Watson), [Am.]. Abonito, March 18, (Williams); San Juan, March 14, (Williams); [Ac.].

HAITI AND SAN DOMINGO: [Br.]. Port au Prince, March 5, (Hughes); Port au Paix, July 22, (Abbott); Samana, June 16, (Abbott); [Ac.]. Au Cayes, June 15, (Watson); Petionville, June 13, (Watson); [Am.].

JAMAICA: [Br.]. Bath, January, (Swanson), [Ac.]. (Watson), [Am.]. Claremont, June, July, (Perkins), [B.].

ST. THOMAS: [Br.]. (Fox), [Ac.]. (Brown, Forbes, Huntington). March 14, April 13, (Perkins), [B.].

ST. KITTS: [Br.]. Basseterre, March 17, 26, (Forbes); February 19, (Fox); [Ac.]. Brimstone Hill, March 16, (Huntington), [B.].

ST. CROIX: (Brown, Huntington), [Am.]. Fredericksted, March 21 to 29, (Forbes), [Ac.]. (Forbes, Huntington), [B.].

ANTIGUA: (Crampton), [Am.]. English Harbour, October 20 to 25, (Porter), [Ac.].

GUADELOUPE: (Huntington), [Am.].

Pyrgus orcus Cramer (*syrichtides* Reverdin)

CENTRAL AMERICA.

SALVADOR: [Ac.].

COSTA RICA: Bocas Del Toro, November 21, (Williams); Limon, November 25, (Williams); [Ac.].

PANAMA: [Br.]. Gatun, Canal Zone, June 17, July 25, September 1, (Rhoads); June 17, (Harrower); Colon, November 19, (Williams); Santiago de Veraguas, (Davies); [Ac.]. Tapia Bridge, October, (Bell); Barro Colorado Island, Canal Zone, October, (Bell); Gatun, Canal Zone, October, (Bell); Summit, Canal Zone, October, (Bell); [B.].

SOUTH AMERICA.

COLOMBIA: [Am.]. [Br.]. Muzo; Eastern Colombia; Aracataca, Magdalena, August 9, (Rehn); Hacienda Cincinnati, Sierra San Lorenzo, Magdalena, 4500 feet elev., August 9, (Rehn); [Ac.]. Cauca Valley, August, September, [B.].

VENEZUELA: [Br.]. Cariaquito, (Brown), [Ac.].

BRITISH GUIANA: Bartica; Pumatumari, Potaro River, June 24, (Forbes), [Ac.].

DUTCH GUIANA: Paramaribo, April 8, (Mayo); Moengo, Boven, Cottica River, May 16, (Forbes); [Ac.].

ECUADOR: [Br.]. Huigra, 4000 feet elev., March, (Rhoads); November, (Coxey); Bucay, 1000 feet elev., November, (Coxey); Naranjapata, 1800 feet elev., November, (Coxey); Dos Puentes, January 8, (Coxey); Panigon; [Ac.]. Huigra; Guayaquil; Tenguel; [B.].

BOLIVIA: [Br.]. Rio Songo; Coroico; Buena Vista, 75 kilometers northwest of Santa Cruz, 500 meters elev., (Steinbach); [Ac.]. Santa Cruz, [B.].

PERU: [Br.]. Madre de Dios; Cuzco; Perene, May 24, September 3; Charumazu, June, (Porter); [Ac.].

PARAGUAY: [Br.]. Villa Rica, January, February, October, November, December, (Jorgensen); Sapucay, January, July, November 21, (Heinrich); [Ac.]. Mubevo, December, (Jorgensen), [B.].

ARGENTINE: [Br.]. Cordoba, (Giacomelli), [B.].

BRAZIL: [Br.]. [Am.]. Santa Catharina, (Pohl); Sao Paulo, January, (Pohl); Chapada, Matto Grosso, January, February, April, December, (Smith); Corumba, Matto Grosso, April, (Smith); [Ac.]. Hansa Humboldt, (Schmith); Annaburg, (Schmith), Sao Paulo, (Pohl); Blumenau; [B.].

TRINIDAD: [Br.]. Port of Spain, July 12, (Forbes), [Ac.]. St. Anns, March, (Huntington); Port of Spain, March, April, (Huntington); [B.].

MARGARITA ISLAND: February 20, (Fulda), [B.].

TOBAGO: [Br.].

WEST INDIES.
GRANADA: [Br.].
ST. VINCENT: [Br.].
ST. LUCIA: [Am.]. [Br.]. November 18, (Porter), [Ac.].
MARTINIQUE: [Am.]. St. Pierre, November 8, (Geddes), [Ac.].
DOMINICA: [Am.]. [Br.]. January 16, [Ac.]. Rosseau, April 11, (Huntington), [B.].

II. ATRYTONOPSIS LUNUS EDWARDS

A figure of the male genitalia of this species was omitted from the Skinner-Williams papers,[7] on the Hesperiidae of North America, for lack of material. Since then we have received this species from Arizona as follows: Baboquivari Mountains, Pima County, March 15 to 30th, (Poling); Oak Creek Canyon, Arizona, July, (Snow); Santa Rita Mountains, July, and White Mountains, July, (Poling); also from Santa Cruz, California, September 14th, (Poling). The male genitalia of an individual from the White Mountains, Arizona, are figured herewith.

FIG. 1. The male genitalia of *Atrytonopsis lunus* Edwards.

[7] Trans. Amer. Ent. Soc., L, p. 70, (1924).

III. Pyrgus communis Grote (tessellata Scudder)

Scudder described this insect as *Hesperia tessellata* early in 1872[8] and a month later Grote[9] described it as *syrichtus communis*. It is unfortunate that Scudder's name must fall, as it has been so long in use for the species, but in 1866 Hewitson described as *Hesperia tessellata*[10] an entirely different insect from Macassar, so preoccupying the name, and setting up *communis* as the specific name of this common insect.

The typē of *communis* is in the collection of the Academy of Natural Sciences in Philadelphia, and that of *tessellata* is in the Museum of Comparative Zoology in Cambridge, Massachusetts.

[8] Rept. Peabody Inst., 1871, p. 73.

[9] Can. Ent., IV, p. 69, (1872); with further remarks on page 220.

[10] Trans. Ent. Soc. London, (3), II, p. 494.

Explanation of Plate VIII

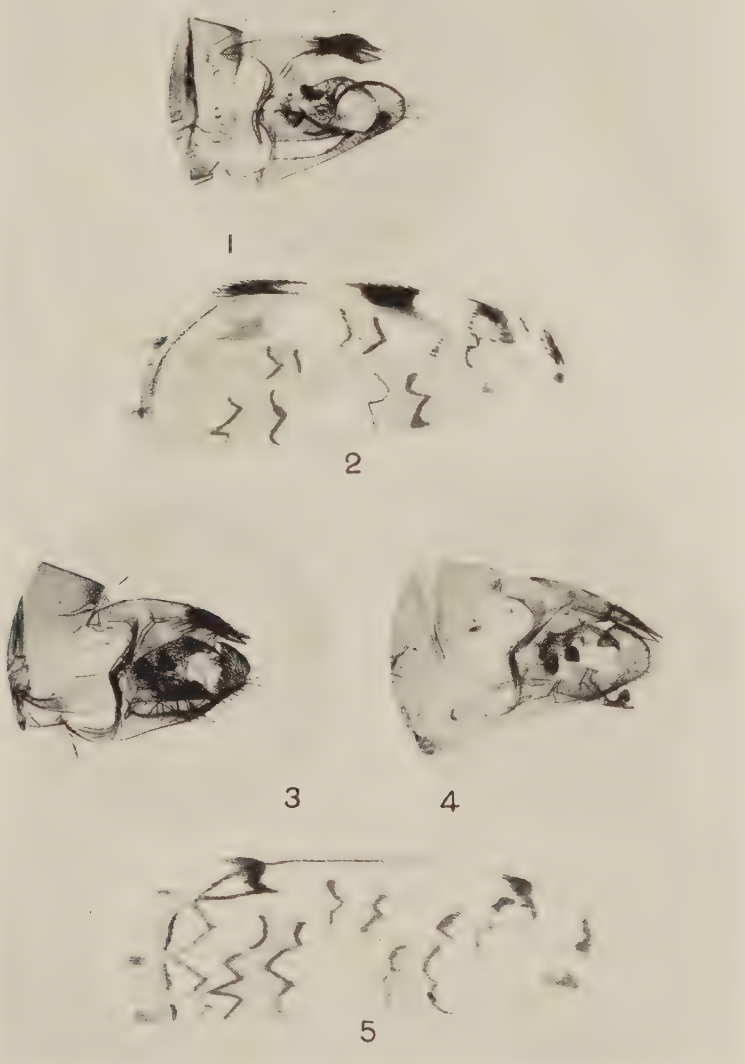
Fig. 1.—*Pyrgus syrictus*. Genitalia of male.

Fig. 2.—*Pyrgus syrictus*. Costal portion of secondary wing, under side.

Fig. 3.—*Pyrgus orcus*. Male genitalia of form 1.

Fig. 4.—*Pyrgus orcus*. Male genitalia of form 2.

Fig. 5.—*Pyrgus orcus*. Costal portion of secondary wing, under side.



WILLIAMS AND BELL—AMERICAN HESPERIIDAE

SOME NEW SPECIES OF SYRPHIDAE (DIPTERA) FROM NORTH AND SOUTH AMERICA

BY F. M. HULL,

College Station, Texas

The material upon which the present paper is based was studied through the kindness of Mr. E. T. Cresson Jr. of the Academy of Natural Sciences of Philadelphia. Types will be found in the Academy collection. In this material several unique forms were discovered.

Syrphus (Epistrophe) flavosignatus new species. (Pl. IX, fig. 9)

A sex-maculate species characterized especially by the shape of the spots, parallel sides of the abdomen, and the long, thick, black hair of the vertex and face.

Male.—Face broad, slightly swollen, tubercle conspicuous; front and vertex, cheeks, margin of epistoma, and a large spot medianly on the face, shining black. First and second joints of antennae black; third missing. Thick, long, black hair on vertex and just before antennae, the latter patch extending down and becoming shorter on the sides of the face.

Thorax and pleurae shining black with thick, dark colored pile. Scutellum lighter in color, shining brownish, subtranslucent, its margin with black bristles.

Abdomen dark blackish, largely shining, its sides nearly parallel with a very small spot on either side of the second segment brownish yellow, and a larger, transverse spot on either side of the third segment, the anterior margin of which is straight and its posterior margin oval. The spots of third segment widely separated. On the fourth segment a pair of similar spots faintly indicated, black in color. Long, thick, pale pile on the abdomen basally, becoming shorter and black in color posteriorly.

Legs black, the narrow apices of anterior and middle femora and the anterior and middle tibiae and tarsi save for a small black spot in the middle of each of the four tibiae, very dark brown. Last four hind tarsi brown, almost black.

Wings hyaline; veins dark brown.

Length, 10 mm.

Type.—Male; Capilano Canyon, Vancouver, British Columbia, (R. J. Crew; March 31, 1902). [No. 6373.]

Syrphus (Epistrophe) monachus new species. (Pl. IX, fig. 10)

Distinguished by its wholly black abdomen, together with shining black face with black pile.

Female.—Face and cheeks shining black, yellowish brown on tubercle and to eye margins and to base of antennae, overlaid with an exceedingly minute and rather sparse microscopic pubescence; dark brown or black, fine scattered hairs on the sides of the face and extending more towards the front just below tubercle; face in length about as long as the width of third antennal joint, unusually swollen and wide, tubercle very prominent. Antennae entirely deep black, opaque with silvery pubescence; arista black, short, thickened on basal two-thirds, the tip white. First joints of antennae separated at base by nearly the distance of third joints length. Front and vertex wide, shining black, the former with hairs quite similar to those of face. Occiput shining black, sparsely pubescent, with black hairs above and dirty whitish hairs below. Eyes very short sparsely pilose.

Thorax, pleurae and sides of scutellum shining black, the middle of latter dull opaque yellowish brown, with dense microscopic whitish pubescence on the lighter area. Squamae pale brownish yellow, with a fringe of long pale hairs. Halteres dark brown. Pile of thorax rather long, dark brown or black.

Abdomen entirely shining black, with the exception of the opaque anterior corners of the second segment; hind margin of fourth, fifth, and sixth segments shining yellow; abdomen widest at posterior border of third segment.

All the femora shining black with the apices yellowish brown; tibiae brownish, lighter basally, hind tibiae with a median brown band, not sharply marked; tarsi black. Wings with a faint brown tinge; stigma brownish yellow; veins brown.

Length, 9 mm.

Type.—Female; Greenland. [No. 6374.]

Baccha tristis new species. (Pl. IX, fig. 7)

This species resembles *lugubris* Will. Differing in color of the hind tarsi and of the pleurae.

Male.—Face shining black, covered with exceedingly thin whitish pollen, giving it a grey appearance and becoming bluish opposite antennae and on sides of the front. The middle of front black, feebly shining, more polished just before the an-

tennae, which is also slightly roughened or rugose. Cheeks shining black, bare. Face covered with fine sparse black hairs, in length equal to two-thirds the width of the third joint of antennae, the hairs becoming more abundant and longer on the front, equal to the full width of third joint. Facial tubercle made rather prominent by the retreating epistoma; concavity below antennae quite shallow. Flattened area before antennae bare. First and second joints of antennae dull black, the second barely longer than the first; third joint and arista, opaque dark brown, the latter short, thickened on the basal half. Pile of vertex black, shorter than on front. Face seen from directly in front distinctly narrower below. Occiput throughout gray pubescent, just above the middle with small group of stiff, black hairs, below with shorter, fine, white hairs.

Dorsum of thorax metallic steel blue, violaceous on the sides and slightly aeneus before the scutellum; bronze colored immediately behind the humeri. Thorax clothed with numerous fine black hairs and with longer similar hair on the pleurae. Halteres dark brown. Squamae with a fringe of short brown hairs.

Abdomen shining, dully bluish to violaceous, opaque black as follows: broadly in the middle of the second segment, a large bell-shaped spot in the middle of the third and fourth segments, each with an apical anterior production, and three small rounded spots transversely on the fifth segment. Dorsum of abdomen clothed with fine, black, appressed hairs, the sides of the third segment and the extreme rim of the second segment with white hair.

All the femora shining black, the narrow apices light brown. Fore and mid tibiae brown, shining, the hind tibiae nearly opaque black. Fore and mid tarsi and the hind tarsi except at the tip dark brown. Hind basitarsi as long as entire mid tarsi, its tip, and the second and third joints of clear yellow with the bristles black and the hairs yellow; the last two joints dark brown. Wings strongly smoky, growing lighter on the posterior half, about two mm. longer than the tip of abdomen.

Length, 12 mm.

Type.—Male; Jalapa, Vera Cruz, Mexico, (P. P. Calvert; October 12, 1906, 4400 ft.). [No. 6375.]

Baccha nodosa new species. (Pl. IX, fig. 8)

A dark colored, small species, with bronze or golden reflections and the third and fourth abdominal segments bimaculate.

Male.—Face shining black, with sparse, exceedingly minute white pubescence extending very narrowly along the eyes the

entire length of front. Vertex shining violaceous, with a few stiff black hairs as long as third joint of antennae. Upper part of front and sides with similar, somewhat longer black hair. Upper section of face with short white hairs. Tubercle prominent; concavity shallow. First and second joints of antennae dark brown, shining; third, light brown, opaque. Area before antennae, flattened, shining, rugose; occiput with whitish pubescence and white hairs in the middle only. Cheeks shining dark brown, lighter on the edge.

Thorax metallic blackish, with bronze or golden reflections on the sides, humeri and mesopleurae. Scutellum metallic blackish with a very few short white hairs. Squamae exceedingly short, white, with long white hairs. Dorsum of thorax strongly sloping forward.

First and second segments of abdomen, metallic with a golden cast, the second with an opaque band in the middle, one-third as wide as the segment is long, the third and fourth each with two small, elongate, opaque black spots in the middle. Fifth segment shining black, more golden on the anterior third. The second segment is slightly narrower posteriorly; the third segment posteriorly is about one and one half times as wide as anteriorly; the width of the fourth segment posteriorly is about two and one half times the width of the second segment posteriorly.

Femora shining brown, very slender, light yellowish brown apically, on the hind and middle femora and on the apical two-thirds of the front femora and base of hind pair. All the tibiae brownish yellow, the apical half of the hind pair dark brown. Tarsi brownish yellow. Wings tinged with light brown, the subcostal cell yellow; an oval spot at the tip of the wing and a small spot near the middle, dark brown.

Length, 7 mm.

Type.—Male; Jalapa, Vera Cruz, Mexico, (Crawford). [No. 6376.]

Mesogramma vitrescens new species.

This species is nearest related to *M. flavopleura* Hall, recently described, but is distinct and unique in the entirely unicolorous abdomen. *M. flavopleura* has an abundant pattern indicated. The present species probably represents one of the forms mentioned by Williston in the Biologia Central-Americana.

Male.—Face shining pale waxy yellow, a large oval shining black spot occupying the middle of face from epistoma to tubercle. Sides of face below and narrowly along the margins

of the eyes until opposite the antennae, with minute silvery pubescence and shorter hairs of the same color. Front light yellow, shining; vertex shining violaceous, from the posterior ocelli to the point of meeting of the eyes, dark brown with an aeneous tinge. Occiput aeneous above, becoming bluish to greenish gray below and covered with whitish pollen with sparse, short, white hairs, longer below. Hairs on vertex, sparse, black; cheeks shining black.

Thorax subshining, with median stripe well indicated and on either side a narrower black stripe, followed by a brown, a black, and another brown stripe on either side. Scutellum aeneus, on the rim shining yellow; a few long hairs on the disk and on rim, white. Pleurae shining greenish to bluish gray, a vertical yellow spot in the middle, widest above, and just below it an oval, horizontal spot. Halteres orange.

Abdomen and hypopygium exceedingly shiny, vitreus, black, on the lateral margins of the fourth and fifth segments becoming reddish. No markings indicated, except in some lights a very narrow, shining, median line. All the femora shining black with the narrow apices sharply light yellow; all the tibiae yellow, the hind tibiae for the greater part of its length in the middle, black, and the fore and middle tibiae briefly in the middle, brown. All the tarsi dark brown, the basal joints of middle tarsi yellow. Wings tinged uniformly grayish brown; veins dark brown.

Length, 7 mm.

Type.—Male; Aracataca, Magdalena, Colombia, (J. A. G. Rehn; August 3, 1920). [No. 6377.]

Meromacrus fucatus new species.

This species is related to *abdominalis* Sack and *aemulus* Will., members of the group with median thoracic lines of yellow pile. From both these it differs in the separation of the post-humeral and cross-sutural stripes. In *aemulus* these are broadly joined and the corners at the jointure of these stripes are rounded in *aemulus* and *fucatus*.

Female.—Face with a wide stripe on either side, joined below antennae and continuing very narrowly along the eyes to opposite lateral ocelli, very pale yellow pubescent; the upper part of facial stripe with short pile of the same color, growing still shorter on the front. Remainder of upper part of front opaque brownish, with a short, median, dash-like streak, yellow pubescent when viewed at the proper angle; front, before the antennae, and a wide, median stripe on face and tubercle shining black, bare.

Borders of epistoma and inside of mouth yellowish brown. All three joints of antennae dark brownish black; arista light orange brown. Occiput clothed with short, thick, yellow pile above, growing paler and more sparse below.

Ground color of thoracic dorsum black, feebly shining in places. There are several longitudinal stripes faintly indicated alternating black ground color with brown pollen. A yellowish brown pollinose area on either side at base of wing, extending narrowly onto post alar calli and conspicuous yellow pilose markings as follows: a posterior stripe narrowly extending onto post alar calli and sending forward a narrow median stripe the entire length of thorax, a wider diagonal stripe behind the humeri to base of wing, and a narrower stripe not connected with the post humeral stripe along the anterior edge of the suture and discontinued some distance from the median dorsal thoracic stripe. The corners of the posterior stripe are rounder where the median stripe is sent forward. A median vertical stripe on the pleurae of the same pile, and on the pleurae some pale yellow microscopic pubescence. Whole dorsum overlaid, from the lateral aspect, with short, thick, yellow hairs.

Abdomen entirely brownish black, feebly shining, the first segment with conspicuous yellow pile, the remainder lacking such pile and overlaid with exceedingly short, appressed, thick, microscopic, black hairs. The lateral margins of the third, fourth, and the sides of the fifth segment with short yellow hair. A row of short, yellow, appressed hairs on the posterior margin of the second segment from the lateral corner one fourth of the distance to median line.

All the femora dark brown, lighter on the apical half of the posterior and middle pairs and on the narrow apices of the first pair. Anterior tibiae dark brown. Remaining tibiae light brown. Tarsi varying from light to dark brown, the anterior pair almost black. Wings hyaline with a brown fore border, becoming yellowish on the basal half.

Length, 11.5 mm.

Type.—Female; Paramaribo, Dutch Guiana, (K. Mayo). [No. 6382.]

SENOCERIA new genus.

This genus is erected for the following undescribed species agreeing with those of *Tatuomyia* Shannon and *Ceriogaster* Williston, in the constricted abdomen, differing from the former in the pubescent metasternum, anterior femoral ornament, non-

bidentate hind tibiae, etc., and from *Ceriogaster* in the straight face, abdomen broadest on the third segment and the discal cross vein joining the discal cell beyond the middle. The thoracic vestiture is not described for *Tatuomyia*. The present form would seem to take a place with *Eumyiolepta* Shannon, and *Nausigaster* Will., and others, in part distinguished by a bizarre type of body pelage, etc.

Dull black species of considerable size with abdomen constricted in the middle of second segment. Face with a median, rounded, ridge; in profile, nearly straight. Front, broad, very flat, totally obscured by appressed pile. Thorax strongly short spiculate. Scutellum simple. Hind femora rather sharply enlarged in the middle, spinose beneath posteriorly, and anteriorly with a transverse claw-like group of four stout spines. Hind tibiae ending in a very prominent, sharp, single spur on inner lower corner. Metasternum quite pubescent. Margin of wing dark. Hind trochanter with short blunt spurs.

GENOTYPE.—*Senoceria spinifemorata* new species.

Senoceria spinifemorata new species. (Pl. IX, figs. 2, 5 and 6)

A black species distinguished by its constricted abdomen, dull coloration and dark bordered wing.

Male.—Face very strongly carinate, with cheeks shining black, the latter tending to reddish, the former with a strip of subappressed, very dense, short pile with a golden tinge, reaching from eye margin where it joins a marginal strip of similar pile, to epistoma. Antennae situated below middle of head in profile. First joint of antennae very short, shining dark brown; second twice as long as first, similarly colored and with short golden tinged pile; third joint twice as long as wide, smallest apically, brownish black; arista long and slender, light brown. Front very flat, entirely covered with a mat of dense, flattened pile, the color of new brass. Vertex opaque black, silvery pubescent anteriorly to the ocelli. Occiput with some short pale hair below and a few stiff, black, spinous hairs above.

Thorax dull black, faintly shining, with a double stripe of minute yellow pubescence medianly, beginning at the front and running a little beyond suture and resembling a double pronged fork, and, with an additional such stripe on either side beginning behind the suture and running nearly to the posterior margin and resembling a slender wedge. They can only be seen at an angle from the rear. The patch on the suture and a spot on the inside of the humeri are thus similarly marked. In addition the thorax is covered with short appressed, yellow hair, and in places with

black stubble or spinous hairs. There is a stripe behind the suture and a spot inside and to the rear of the humerus consisting of stubble and appearing velvet black above. Scutellum black, subshining, metallic on the rim, with some black stubble on the disk as well as a few hairs and with a very thick border of short yellow hair on the rim and directed downwards.

Abdomen black, subshining, widest on third segment, with a few yellow hairs and many appressed black, bristly hairs on the second and third segments and thick, short, yellow hair on the fourth segment.

Hind femora stout, especially thickened dorsally, with nine to twelve very strong spines below; all the femora black, subshining. Tibiae and tarsi dark brown, hind tibiae with a spur apically, not scoop-like. Basal hind tarsus with a tuft of yellow hair basally. Hind trochanters with a short spur. Wings villose with a greenish brown tinge, dark brown on entire anterior half. Length 12 mm.

Type.—Male; Brazil, (H. B. Merill). [No. 6383.] *Paratype.*—♂; same locality [in my collection].

CACOMYIA new genus.

Medium sized, dull colored flies with constricted abdomen, its greatest constriction on the second segment anteriorly and the greatest enlargement on the fourth segment. Antennae long and slender with dorsal arista. Hind femora very much thickened, unusually slender basally, spindle-shaped. Hind tibiae ending in a sharp spur. Metasternum pilose, wings villose, with dark anterior border. Head elliptical; face broad, projecting a little downwards with a small tubercle in the middle in profile. Pile restricted more or less to two peculiar vertical facial bands. Pile of thorax simple. Scutellum simple.

GENOTYPE.—*Cacomyia cressoni* new species.

This genus should probably be regarded as an aberrant member of the Xylotini rather than among the Temnostomini. The antennae and face undoubtedly are reminiscent of *Temnostoma* and *Sphecomyia*. On the other hand the heavily swollen hind femora, lack of bright contrasted markings, pollinose vestiture, etc., seem to ally it to the tropical Xylotini. The constricted abdomen has arisen too frequently among Syrphid types to be considered an indication of position.

Cacomyia cressoni new species. (Pl. IX, figs. 1, 3, 4)

Characterized by its two narrow thoracic vittae; vertical, pilose, facial stripes; light brownish coloration, and a small yellowish spot at the base of the second abdominal segment.

Female.—Face and cheeks shining, the latter brown, the former brownish yellow below tubercle to epistoma, becoming then brown and black above; covered with exceedingly microscopic pubescence, rather dense, and with a conspicuous band of pile, of short dense silvery hairs, proceding from face margin opposite or just below antennae downwards to epistoma. Tubercle prominent, almost no concavity above. Eye margin along face prominent, silvery pubescent with an interrupted bare spot in the middle, which together with a pilose rounded marginal spot on the eye margins opposite the front, gives the face in some lights the appearance of having four silvery spots. Front and vertex shining black, the former opaque in the middle; a few short black hairs on the upper part of front and on vertex. Posterior ocelli slightly closer to one another than to anterior ocellus. No occipital margin except narrowly above; occiput grayish or whitish pubescent. First joint of antennae slender, brownish yellow, darker just at tip, with black, appressed hairs or bristles, the joint about as long as width of front above antennae. Second joint half as long as first, a little wider apically, similarly colored, pilose. Third dark brown, broken off just beyond arista. Arista broken off at base. There is a row of short, epistomal-marginal pile.

Thorax black, subshining, covered with thick, appressed, short, yellow hair, and with two longitudinal stripes running the entire length, of peculiar, dense, retrorse, appressed hairs having a golden tinge, especially noticeable in some lights. A short strip of similar pile upon the inner margin of the humeri, crescentic, and another upon the dorsal thoracic suture. Scutellum small, shining brown on the disc, with a yellowish rim of short upright golden pile.

Abdomen shining dark brown with a bluish black luster, in shape rather slender, its greatest constriction being on the anterior part of the second segment and its greatest width on the fourth segment. On the anterior part of the second segment and continuing on the first basally, is a translucent, yellowish spot taking the shape of a double acute triangle, whose acute angles point posteriorly, and whose bases join at the top. A yellow median spot is present on the anterior part of the first segment.

All the femora shining light brown, all but the anterior pair yellowish basally, the hind pair noticeably and all three pairs yellowish apically. Hind coxae very large; hind femora ex-

cessively and regularly swollen in the middle, very small at the base, thus imparting a pinched out effect. Remainder of legs light shining brown; hind tibiae with a strong scoop apically. Wings very glossy and clear. The fore border narrowly brownish; subcostal cell clear.

Length including antennae, 12 mm.

Type.—Female; "Mexico." [No. 6384.]

I take pleasure in naming this peculiar fly for Mr. E. T. Cresson Jr.

Volucella chlorosa new species.

Distinguished among *Volucella* s. str. by its small size and pale green, non-metallic coloration.

Female.—All of the head shining and polished, bright green, non-metallic, a narrow brown stripe from eye to epistoma, the lower edge of cheeks and lower occiput pale, cream-colored. A faint median stripe light brown and the area just surrounding the ocelli darker brown. There is a semicircular black spot on the border of the eye in the middle of the front and an indistinct spot on the front just before the antennae. Antennae and prominence above, narrowly, pale, brownish yellow. Arista pale, loosely plumose. Eyes densely short pubescent; middle and upper occiput with microscopic whitish pubescence.

Thorax, pleurae and scutellum non-metallic shining green, the disk of former with several obscure, more or less fused stripes of dark brown and with a yellow lateral stripe from humeri to base of scutellum, interrupted at the suture. Pile of thorax and scutellum, appressed, short, light yellow. Bristles on the sides and on scutellum, slender and black. There is no preapical depression and there are no lateral rugosae. There is however, a narrow, depressed, marginal rim running the entire marginal length of the scutellum. Halteres pale, cream-colored.

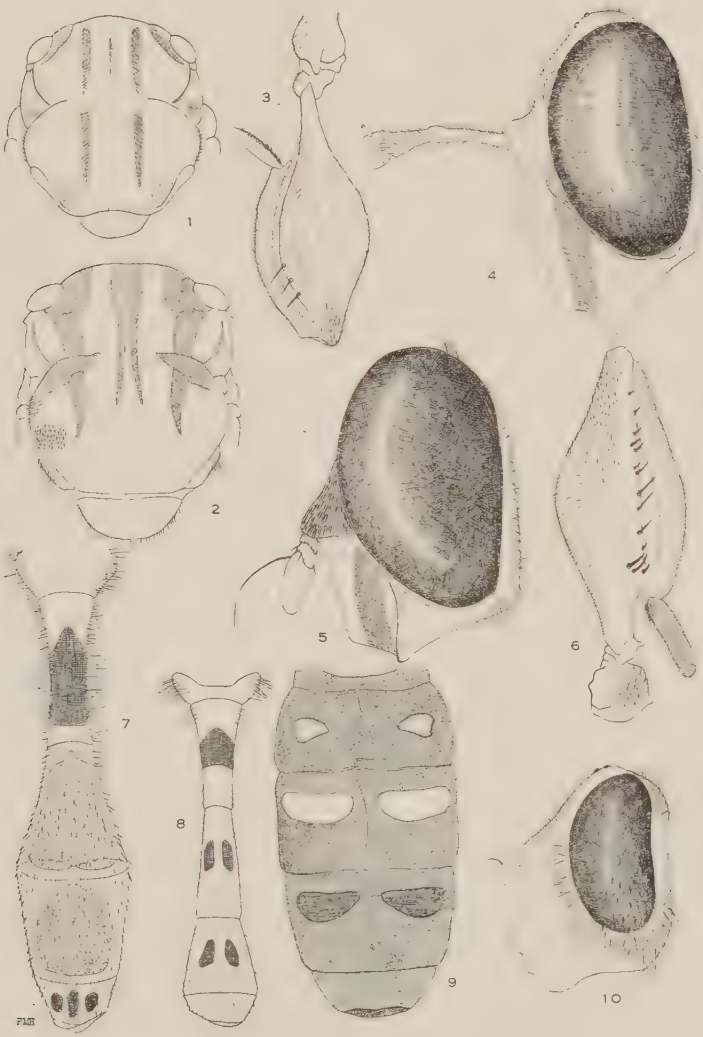
Abdomen pale green, subtranslucent, all the lateral margins beyond the second segment and the anterior and posterior margins of second segment to fourth segment narrowly shining black. Legs more or less uniformly shining brownish lighter on the apices of the femora, with the anterior fore tarsi nearly black. Wings subhyaline, villose, faintly brownish with the veins infuscated.

Length, 7 mm.

Type.—Female; "Mexico." [No. 6385.] *Paratype.*—female; same locality.

Explanation of Plate IX

Fig. 1.—*Cacomyia cressoni.* Thorax.
Fig. 2.—*Senoceria spinifemorata.* Thorax.
Fig. 3.—*Cacomyia cressoni.* Hind femur and tibia.
Fig. 4.—*Cacomyia cressoni.* Lateral view of head.
Fig. 5.—*Senoceria spinifemorata.* Lateral view of head.
Fig. 6.—*Senoceria spinifemorata.* Hind femur and tibia.
Fig. 7.—*Baccha tristis.* Abdomen.
Fig. 8.—*Baccha nodosa.* Abdomen.
Fig. 9.—*Syrphus* (*Epistrophe*) *flavosignatus.* Abdomen.
Fig. 10.—*Syrphus* (*Epistrophe*) *monachus.* Lateral view of head.



HULL—AMERICAN SYRPHIDAE

NEW SPECIES OF EREBIA

(LEPIDOPTERA: SATYRIDAE)

BY W. J. HOLLAND

Carnegie Museum, Pittsburgh, Pennsylvania

A recent revisional study of the American species of the genus *Erebia* has led me to the conclusion that there are at least two species in our fauna which have not hitherto been described.

Erebia fasciata was originally described by Butler in his Catalogue of the Satyridæ of the British Museum published in 1868. His brief Latin diagnosis was founded upon nine specimens, the locality of which he gives as "Arctic America." Elwes[1] indicates that Butler's specimens were taken at Winter Cove, Cambridge Bay, on the voyage of Collinson. He further states: "This, so far as I know, has never been taken except at Winter Cove, in Cambridge Bay, Victoria Land, about 69° N., 107° W., by Capt. Collinson's expedition, and by Sir John Richardson's expedition on the Arctic coast in 67–68° N. These specimens are all in the British Museum, except one pair, which I received in exchange from this source."[2]

The first published figure of the species is that given by Butler[3] which shows the under side only of what presumably must be accepted as the typical female of *E. fasciata* Butler. I have two of the original nine specimens, upon which Butler founded his description of the species. They were presented to Mr. W. H. Edwards by the Trustees of the British Museum at the instance of Dr. Butler, to be described and figured by Edwards in the third volume of the Butterflies of North America. Butler, the author of the species, sent them to Edwards as typical *fasciata*. The male is wholly black on the upper side without any trace of rufous. The female is somewhat broadly marked on the primaries and faintly on the secondaries by suffused rufous, recalling, as Butler

[1] Trans. Ent. Soc., London, XLVI, p. 183.

[2] Elwes' specimens appear to have been a pair from the Richardson catch.

[3] Cat. Satyrid. Br. Mus., Plate 2, fig. 8, (1868).

points out in his original description, the coloration of *E. discoidalis* Kirby, with which, however, the species has nothing whatever to do.

Chapman has pointed out that genitalically *E. fasciata* is closely related to *magdalena* Strecker of Colorado and *erinna* Staudinger.[4] Judged by form and markings these three species, which Chapman for genitalic reasons is inclined to regard as one and the same, are totally different; and it is hard, in spite of what Chapman has written, to agree with his conclusion. *Erinna* Stgr. is allied to *E. glacialis* Esper.

E. fasciata evidently presents itself in two forms in the male sex. I am informed by Dr. J. McDunnough of Ottawa that they have eighteen specimens in their collection labeled as *fasciata*, six males of which are uniformly black on the upper surface like *magdalena*, thus agreeing in this sex with the type specimen sent to Edwards by Butler. The other specimens of the male show some rufous as delineated by Gibson.[5] Butler's Latin diagnosis apparently was based upon the nine specimens before him with an eye to the females, without discriminating the difference which existed in the color of the nine specimens which he collectively accepted as the types. The figures of *fasciata* given by Elwes[6] are not strictly typical, showing broad rufous bands on the under side of the primaries. It is evident, as the result of careful investigation, that the specific name *E. fasciata* has been applied in a broad and rather loose way to a number of allied forms from the arctic regions of Siberia and America, and that at all events there is considerable varietal difference. In fact it appears that owing to the paucity of material at present in collections there has been a mingling under the specific name *fasciata* of several forms, which may ultimately prove to be valid subspecies, if not species. Edwards in his account of *E. fasciata*[7] mentions that he has "another specimen taken by E. W. Nelson at Kotzebue Sound 'in his hat,'" and states that this specimen differs from typical *fasciata*, mentioning the presence of a "dull ferruginous band" both on the primaries and secondaries on the upper side. This specimen is also in my possession, and is before me as I write. It is a female,

[4] Iris, VII, pp. 247 and 376.
[5] Can. Arctic Expedition, 1913–18, III, Pl. 4, fig. 8.
[6] Trans. Ent. Soc. London, LI, 1901, Pl. 9, figs. 11 and 12.
[7] Butt. No. Am., III.

and like all specimens taken in the way described by its captor, not in very fine condition. The fore wings are well preserved, but the hind wings are torn, fortunately not both in the same way, so that what one lacks the other supplies. It is therefore quite easy to make out the characteristic features of both the upper and lower sides of the wings.

My learned colleague, Dr. Avinoff, quite recently has called my attention to the fact that some years ago he presented to the Carnegie Museum a male and two female specimens, collected by Mr. August J. Kusche in Eastern Siberia at Indian Cape (latterly designated on maps as Cape Tsukotski) on Behring's Strait, which are undoubtedly the same insect as the specimen taken by Nelson We at once looked up the matter, and after a critical study of the three specimens obtained from Kusche and the one taken by Nelson I am fully persuaded not only of the specific identity of the four, but also of the fact that they are not the same as *E. fasciata* Butler, but represent an hitherto unnamed species. To this I apply the name of my friend and fellow student, the learned Director of the Carnegie Museum.

Erebia avinoffi sp. nov.

♂.—Differing on the upper side from typical *E. fasciata* Butler, typical males of which on the upper side are "black immaculate" and in this respect 'resembling *E. magdalena*' as Edwards correctly states. On the upper side the ground-color is not black but moderately dark brown, and both wings are traversed on their limbal area by a relatively broad and rather sharply defined submarginal band of pale rufous, less conspicuous on the secondaries than on the primaries. On the fore wing the band extends from the fifth subcostal nervule to the inner vein, not therefore reaching the costa nor the lower margin of the wing. It is quite uniform in width sharply defined externally and internally, and occupies about one-fifth of the longitudinal diameter of the wing. It is continuous, not broken up into separate spots, the only divisions which appear being due to the slightly darker color of the veins, which intersect it. The corresponding band on the hind wing is not quite as well defined as that on the fore wing, the margins being more diffuse, the color not as bright, and it tends toward the anal angle to become broken into spots; in its course it is regularly curved, parallel to the outer margin of the wing, but tending to diminish in width as it approaches the anal angle. On the under side the basal area is gray, this tract having a slightly bilobate

appearance resulting from the intrusion into it of a tooth-like inner projection from the dark mesial band, which succeeds it, this being especially true of the hind wing. The mesial band which follows the gray basal area in the fore wing of the solitary male before me is reddish brown, defined inwardly and outwardly by black lines, but on the fore wing does not reach the costa nor the inner margin. On the hind wing the mesial band is much darker than on the fore wing, rich brown sharply defined both inwardly and outwardly by deep black lines slightly toothed at the veins externally and more so internally. This dark mesial band is succeeded outwardly by a paler band parallel to it, corresponding in location to the rufous macular band on the upper side of the wing. In the fore wing of the male before me this light band has a distinctly reddish cast, on the hind wing it is pale stone-gray. On the hind wing just below the costa and also opposite the end of the cell there is a small pure white spot, corresponding in color and location to the similar spots which are found in *E. disa* and its allies. This light band both on the primaries and secondaries is rather sharply constricted just below the costa, where it widens suddenly outwardly, giving it a sharp tooth-like external projection on the costa. Outwardly on both wings it is sharply defined or set off from the marginal area by deep black lines. The outer marginal area on both wings is vinaceous gray, and the marginal area, because of the relatively narrower width of the light submarginal band, which is not as wide as in *E. fasciata*, is broader than in the latter species.

♀.—The three females before me agrèe quite closely in their markings, and do not differ materially from the male, except that on the under side the light macular band on the fore wing of this sex shows no trace of the red which is found in the male specimen I have described, and all are pale stramineous, with the lighter areas brighter than in the male, and the bands more sharply defined by the dark bordering lines.

The bodies of the insects are black, as are the palpi, and the antennæ, and there is nothing, so far as these parts are concerned, which calls for comment.

Expanse: ♂, 40 mm.; ♀, 50 mm.

Holotype.— ♀; Collected at Kotzebue Sound, Alaska, by E. W. Nelson, 1881. *Allotype.*—♂; Collected at Indian Point, Eastern Siberia, by August J. Kusche, July 7, 1913. *Paratypes.*—Two ♀; Collected by A. J. Kusche, with allotype.

The species will be figured in the forthcoming new edition of The Butterfly Book.

Erebia steckeri sp. nov.

♂.—Both wings on the upper side uniformly brownish fuscous. Externally below the apex a submarginal series of four subcircular red spots centered with black minutely pupilled with white, and located on the interspaces between the upper radial and the second median nervule. The two upper spots often coalesce; the two lower spots are usually separate and distinct. The fringes are checkered with white. On the lower side the fore wings are a shade darker than on the upper side, blackish brown, the submarginal ocelli as on the upper side, but often less clearly defined. The hind wing has the basal area iron-gray; the mesial band jet-black, sharply defined outwardly and inwardly; at the costa and opposite the end of the cell external to the band are two small white spots corresponding to those found in *E. disa*. The extra mesial band is iron-gray like the color of the basal area, defined outwardly by a narrow curved black line running from the costa to the inner margin near the anal angle. The marginal area external to this line is of the same color as the post-mesial band, which it succeeds, but a shade darker.

♀.—This sex does not differ markedly in the style of maculation from the male, except that the ground-color is a shade paler on the upper side, and the markings on the under side are brighter and somewhat more strongly accentuated. Expanse: ♂, 35 to 42 mm.; ♀, 38 to 45 mm.

Described from an extensive series of specimens collected on the Kuskokwim River in Alaska by the Rev. A. Stecker, long in charge of the Moravian Mission, in whose honor I name the species.

Male holotype, female allotype, and male and female paratypes will appear on Pl. LXI of the new edition of The Butterfly Book. Paratypes: sixty to seventy specimens from the same locality and season.

As might be expected in such a large assemblage of specimens individual variation is detected. I have a dwarf male and several aberrant individuals, one of which, a male, has the mesial band on the lower side of the hind wing very narrow and interrupted at the end of the cell. Such freaks are worthy of note, but not of description, much less of being named.

A CONTRIBUTION TO THE KNOWLEDGE OF NEOTROPICAL MEGACHILE WITH DESCRIPTIONS OF NEW SPECIES*

(HYMENOPTERA: MEGACHILIDAE)

BY THEODORE BERTIS MITCHELL

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INTRODUCTION

A revision of the genus *Megachile* as it occurs in North America has been in course of preparation by the writer for some time, and it became necessary for a better understanding of the affinities of the various groups of species to make at least a brief survey of the genus as it occurs in the Palaearctic and Neotropical regions. A considerable amount of material from South and Central America was therefore loaned to me by the Academy of Natural Sciences of Philadelphia [A. N. S. P.], this being largely the collection of Mr. H. H. Smith, made in the State of Matto Grosso, Brazil, with scattered specimens from other localities. A somewhat smaller collection was sent to me for determination by Dr. Reinholdt Meyer [Meyer], of Darmstadt, and some additional material was also loaned by the Museum of Comparative Zoology of Harvard University [M. C. Z.]. A most valuable collection from the viewpoint of definite locality, date and flower records was received from Dr. George Salt [Salt], made in Colombia, and a collection from Dr. E. G. Titus [U. S. N. M.], composed largely of North American species, contained a few neotropical forms, including four which are described here. Dr.

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Meyer's collection was in large part from Bolivia and Paraguay, while that received from the Museum of Comparative Zoology contained specimens from Argentina, Peru, Chile, and other scattered localities.

This paper does not represent, therefore, the results of a thorough study of all of the available material, as there are many other sources from which additional material can probably be obtained. It has seemed advisable to limit the present paper to a preliminary survey of the Neotropical species, delaying the more complete study of the genus in this region which I hope to make until after the revision of the North American species has been completed. The number of forms occurring in the tropics is extremely large, with a relatively small proportion of them described at the present time, and a complete survey of the South and Central American species will require much additional study. Moreover, the difficulties encountered in a study of the species of this region are by no means inconsiderable. Types are located in widely scattered parts of Europe, South America and North America, and examination of type material therefore is very limited to one of limited travel resources; and descriptions are often inadequate, many of them being largely confined to color and color patterns of pubescence, mention of structural characters being limited to the more conspicuous peculiarities of certain forms, and these same characters being again ignored in other species. Color, I believe, is very unreliable, especially in tropical regions, and while it should be by no means ignored, it would seem more logical to place the emphasis upon structural characters, especially since these give a better idea of the affinities of the various recognizable groups of species.

In this paper, therefore, an attempt has been made to place more emphasis upon those structural characters that have been found especially valuable in the determination of group affinities. In the key the major subdivisions have been made on these differences of structure, and color has been used only as a last resort. In fact, where structural differences are lacking, especially in the male, only a very marked and apparently constant color difference would warrant any distinction other than as color variation. In the females, however, it is possible that many of the species will not be distinguishable other than by relatively

minute differences of either color or structure. There are certain species, for instance, the females of which are practically impossible to separate, whereas the corresponding males are easily identified. We cannot be certain, therefore, concerning the validity of many of the species described, especially of the female, until the other sex has been recognized and described. A species described from but one sex is in reality only half described, and in this group of insects, exhibiting such extreme sexual dimorphism, these partial descriptions seem to be inevitable.

A brief perusal of that portion of this paper designated as "Descriptions and Records" will reveal a considerable number of new species and consequently the addition of many more names to the list of species. In view of the difficulties in the way of correct determination of species and the inaccessibility of types, it might well be asked just how certain the author is that these have not already been described and these names therefore merely amount to an addition to synonymy. This possibility must of course be admitted, and is more or less taken for granted in all cases where comparison with the type has not been made. However, with the large majority of these apparently new forms, all the described species have been eliminated by their failing to agree with those herein described. The greatest element of chance lies in the fact that so many of the descriptions have emphasized color to the practical elimination of structural characters, and consequently some of these new species may later prove to be merely color variations of previously described species. Where such is the case, however, the knowledge of that particular species will at least be more adequate, and that fact atones to some degree at least for the addition to synonymy, in the writer's opinion.

The previously described species which have been recorded here, and included in the key, have been in part determined by the author and in part by other workers. Where the determination was made by someone other than myself, this is so indicated in the record, and those few species which have been compared with the types, and are therefore more reliably identified, are so indicated. All of those species which I have identified agree well enough with the descriptions, but the possibility of misidentification must be admitted.

No attempt to designate the groups within the genus, either as subgenera or new genera, has been made in this present paper. The knowledge of the genus in this region is too inadequate at the present time to warrant any subdivision into smaller groups, and while it may ultimately prove advisable to recognize subgenera, and possibly new genera in some cases, this cannot be done intelligently until the species have been more fully described and the sexes correlated to some extent at least. Moreover, the writer is inclined to agree with Needham[1] in believing that multiplication of genera leads to confusion. Subgenera are convenient to the taxonomist in designating natural groups of species, but these same names elevated to the rank of genus would result in the loss of the original genus as a concept, especially in this instance where none of the species of the genus s. str. occur in the region. A large genus is not in itself desirable, but is preferable (in the writer's opinion) to many smaller groups of generic rank, and new genera should not be erected except where the group limits are reasonably sharply defined, and then only after a thorough survey of the larger group.

KEY TO THE NEOTROPICAL SPECIES OF MEGACHILE

Antennae 13-jointed; sternites five to six entirely retracted, the exposed sternites relatively bare of pubescence..... MALES

Antennae 12-jointed; six sternites exposed, these with a dense brush of setae which function in transporting pollen..... FEMALES (p. 166)

MALES

1. Mandibles with a definite projection or tooth on the inferior margin.....2
   Mandibles entirely lacking an inferior projection.....40
2. Only three abdominal sternites exposed.....3
   With four abdominal sternites exposed.....4
3. Joints one to three of front tarsi broadly dilated, each one fully as wide as it is long.....*otomita* Cress. (p. 176)
   Front metatarsus much longer than wide
   cartagenensis n. sp. (p. 176)

[1] Science, LXXI, No. 1828, p. 26, (1930).

4. Front metatarsi dilated, usually pale in color.....5
   Front metatarsi not at all dilated, usually dark.....29
5. Mid tibia with the usual apical spur.....6
   Mid tibia lacking an apical spur.....12
6. Abdomen entirely ferruginous...*ferruginosa* n. sp. (p. 183)
   Abdomen black in large part.....7
7. Mid femur with an acute median tooth on the ventral margin.....*dentipes* Vach. (p. 182)
   Mid femur not toothed.....8
8. Abdominal segments definitely fasciate.....9
   Abdomen lacking definite fasciae.....11
9. Front metatarsi with extremely long *anterior* hair-fringes *hilarimorpha* Str. (p. 184)
   Front metatarsi without long anterior hair-fringes.....10
10. Front metatarsal scale much produced apically; hind legs black.....*obdurata* n. sp. (p. 180)
    Front metatarsal scale only slightly produced apically; legs entirely ferruginous.....*imperator* n. sp. (p. 185)
11. Lower angle of cheek bare, with a conspicuous acute triangular projection.....*cruziana* n. sp. (p. 181)
    Lower angle of cheek densely white pubescent, without a conspicuous projection..*coelioxiformis* Schrott. (p. 282)
12. Mid metatarsi fully as long as the mid tibiae *vernoniae* Schrott. (p. 187)
    Mid metatarsi shorter than the mid tibiae.....13
13. Abdomen entirely ferruginous.....*pulchra* Sm. (p. 191)
    Abdomen largely dark.....14
14. Front metatarsal scale produced apically fully to the tip of the second tarsal joint.....15
    Front metatarsal scale not conspicuously produced apically 16
15. Segments five and six largely pale pubescent, with but a few erect black hairs on segment six; segment five pale fasciate.....*prietana* n. sp. (p. 191)
    Segments five and six largely black pubescent, with but a slight amount of appressed greyish tomentum; segment five not fasciate.....*curvipes* Sm. (p. 192)
16. Mandibles with an acute angle on the inferior margin, midway between the apical tooth and the apex of the inferior projection (see *furcata*, Pl. X).....17
    Inferior margin of mandibles lacking a definite acute angle 20

17. Front metatarsi very broadly dilated, width at apex being about equal to the length of the joint
furcata Vach. (p. 192)
Front metatarsi much longer than they are broad at apex. 18
18. Front metatarsi distinctly broader apically than at base. 19
Front metatarsi not at all broadened apically
chapadiana Mitch. (p. 193)
19. Dorsal surface of segment six densely covered with pale yellow tomentum, entirely hiding the punctures
inscita n. sp. (p. 196)
Segment six but thinly pubescent above, the punctures clearly visible.....*agrestis* n. sp. (p. 197)
20. Front femora strongly keeled beneath apically, and with the margin of the posterior face opposite the keel very sharply and strongly carinate.....21
Upper margin of posterior face of front femora not carinate 26
21. Segments four to six entirely black pubescent except for the apical white fasciae on segments four and five
pollinosa Spin. (p. 199)
Discs of segments four to six with at least some pale pubescence.....22
22. Front metatarsi definitely broader at apex than at base. 23
Front metatarsi parallel-sided, not broadened apically; segments five and six with only a few black hairs, if any. . 25
23. Segments five and six of abdomen with pubescence entirely pale.....*velhoensis* n. sp. (p. 199)
Segments five and six with much conspicuous black pubescence.....24
24. Legs, antennae and tegulae entirely ferruginous
arabilis n. sp. (p. 201)
Middle and hind legs fuscous.....*perita* n. sp. (p. 202)
25. Inferior margin of mandible with a definite, though not acute, median angle; segment five with conspicuous erect black pubescence....*chapadiana* Mitch. (p. 193)
Inferior margin of mandible without a definite median angle; pubescence of segment five entirely pale fulvous
gomphrenae. Holmbg. (p. 203)
26. Slender species; front metatarsi but slightly dilated, parallel-sided, not appreciably broader apically
manaosensis n. sp. (p. 203)
Robust species; front metatarsi considerably broadened apically.....27

27. Legs and tegulae entirely ferruginous; pubescence of mesonotum dense and yellow; larger (12 mm.) *infinita* n. sp. (p. 204)
At least the hind femora and tibiae dark; pubescence of mesonotum thin and greyish; smaller (10 mm. or less) 28

28. Outer margin of mandibles quite evenly rounded *bernardina* Schrott. (p. 205)
Outer margin of mandibles conspicuously angulate *candida* Sm. (p. 206)

29. Carina of segment six obtusely triangular in outline, entire medially ..... *flavihirsuta* n. sp. (p. 225)
Carina emarginate medially, at least to a slight degree . . 30

30. Carina composed of from six to eight spine-like denticulations ..... *brasiliensis* D. T. (p. 237)
Carina not denticulate, merely emarginate medially 31

31. Pubescence of legs, vertex, mesonotum, pleura and abdomen dorsally, black ..... *colombiana* n. sp. (p. 227)
Pubescence in large part pale, or with conspicuous abdominal fasciae 32

32. Segment six without pale appressed tomentum, the erect hairs black and sparse ..... *continua* n. sp. (p. 239)
Segment six with considerable pale appressed tomentum . 33

33. Segment five without an appreciable amount of pale tomentum except near the base 34
Segment five largely covered with pale appressed tomentum 37

34. Legs and tegulae entirely ferruginous . *prudens* n. sp. (p. 238)
At least the legs dark 35

35. Head and thorax with considerable black pubescence . . . 36
Head and thorax with pubescence entirely pale *digna* n. sp. (p. 240)

36. Abdomen with narrow white apical fasciae which are broadly interrupted medially ..... *angusta* n. sp. (p. 241)
Abdomen with conspicuous entire yellow fasciae *anthidioides* Rad. (p. 238)

37. Anterior face of front coxae entirely bare and polished *aetheria* n. sp. (p. 229)
Anterior face of front coxae at least thinly pubescent . . . 38

38. Pubescence of face entirely whitish, with no black hairs evident; segment five grey tomentose, with numerous erect black hairs ..... *beniensis* Ckll. (p. 229)
Face with a few intermixed black hairs at sides; segment five with appressed yellowish tomentum, the erect hairs also largely or entirely pale 39

39. Pubescence of pleura above blackish. *squalens* Hal. (p. 240)
Pubescence of pleura entirely whitish
paraxanthura Ckll. (p. 241)

40. Only three ventral abdominal plates exposed.....41
Four abdominal sternites at least partially exposed.....42

41. Segments four and five entirely covered with pale fulvous tomentum; legs red.....*abacula* Cress. (p. 177)
Disc of segment four largely bare; legs black
gualanensis Ckll. (p. 177)

42. Front tarsi more or less dilated, usually pale in color....43
Front tarsi simple, usually black.....53

43. Mandibles modified, the outer face deeply concave
concava n. sp. (p. 242)
Mandibles not so modified.....44

44. Abdomen entirely ferruginous.....*aurea* n. sp. (p. 244)
Abdomen black.....45

45. Front metatarsi broadly dilated, exceeding the tibiae in width.....*jucunda* n. sp. (p. 245)
Front metatarsi at most no wider than the tibiae.....46

46. Lower angle of cheek with a conspicuous, robust, acute projection.....*aequalis* n. sp. (p. 246)
Lower angle of cheek not produced.....47

47. Segments one and two not fasciate, with mostly dark pubescence.....*blanda* n. sp. (p. 247)
Segments one and two either with conspicuous apical fasciae, or largely covered with dense yellowish tomentum..48

48. At least segments three and four largely covered with dense yellowish tomentum.....50
Abdominal segments with pale apical fasciae, the discs either with thin pubescence or with black pubescence
49.

49. Segments five and six black pubescent; segment five not fasciate.....*tapytensis* Mitch. (p. 248)
Segment five with a pale apical fascia; segments five and six largely pale pubescent.....*illustris* n. sp. (p. 188)

50. Black hairs of face largely confined to clypeus; segment five with but a very slight amount of yellow tomentum, being conspicuously black pubescent
guaranitica Schrott. (p. 248)
Face with considerable black pubescence above clypeus; segment five with conspicuous yellow tomentum...51

51. Segment five with a definite and relatively narrow yellow apical fascia, the disc largely covered with scattered black hairs.....*congruens* n. sp. (p. 248)
Disc of segment five largely covered with yellow tomentum, without a definite apical fascia.....52

52. Legs entirely ferruginous, with pubescence pale except on front and hind metatarsi.....*bella* n. sp. (p. 249)
Legs blackish in large part, with considerable black pubescence.....*trucis* n. sp. (p. 251)
53. Front coxae spined, although the spines often short and inconspicuous.....54
Front coxae without any evidences of spines.....62
54. Lower angle of cheek angulately produced *ivonensis* Ckll. (p. 256)
Lower angle of cheek simple.....55
55. Posterior margin of cheeks sharply carinate *turbulenta* n. sp. (p. 255)
Posterior margin of cheeks rounded.....56
56. Carina of segment six slightly pointed medially *orba* Schrott. (p. 255)
Carina roundly emarginate medially.....57
57. Wings yellowish, the nervures pale ferruginous or ochraceous 58
Wings either hyaline or smoky, the nervures dark.....59
58. Pubescence of mesonotum brownish-fuscous; apical abdominal segments red.....*expleta* n. sp. (p. 252)
Pubescence of mesonotum whitish or ochraceous; abdomen black apically.....*turpis* n. sp. (p. 253)
59. Segment six with dense appressed yellowish tomentum which entirely hides the surface..*futilis* n. sp. (p. 254)
Segment six without dense tomentum.....60
60. Segments five and six with conspicuous long black pubescence; segment five not fasciate.....*praefica* Grib. (p. 293)
Segment five with an entire conspicuous apical fascia; black pubescence of segments five and six short.....61
61. Antennae longer, reaching the apical margin of segment two of abdomen, the joints about three times longer than broad.....*stomatura* Ckll. (p. 283)
Antennae shorter, not reaching beyond the basal abdominal segment, the joints hardly more than twice as long as broad.....*aegra* n. sp. (p. 283)
62. Mesosternum with a median longitudinal groove or concavity, the margins of which are densely tomentose.63
Mesosternum not grooved.....65
63. Scutello-mesothoracic suture not fasciate *melanopoda* (?) Ckll. (p. 263)
Scutello-mesothoracic suture with a conspicuous white fascia.....64

64. Mesosternal groove wide and deep; cheeks with conspicuous black hair-tufts below. . . *philinca* var. a. Ckll. (p. 263)
Mesosternal groove linear; cheeks entirely white pubescent *anodonta* Ckll. (p. 263)

65. Posterior margin of cheeks sharply carinate 66
Posterior margin of cheeks only very inconspicuously carinate, if at all 72

66. Carina of segment six either entirely lacking a median emargination, or with a scarcely perceptible one *semota* Ckll. (p. 263)
Carina either definitely emarginate medially, or consisting of two acute widely separated teeth 67

67. Larger (11 mm.); tegulae pale ferruginous *donata* n. sp. (p. 269)
Smaller (7 mm. or less); tegulae dark 68

68. Pubescence of mesonotum thin but erect. *cara* n. sp. (p. 263)
Pubescence of mesonotum usually appressed, with color changeable at varying angles 69

69. Segment six without dense appressed tomentum *mobilis* n. sp. (p. 264)
Segment six with dense appressed pale tomentum 70

70. Mesonotum uniformly dull, very densely and finely punctate; tomentum of segment six white *microdontura* Ckll. (p. 266)
Mesonotum somewhat shining laterally, with punctures close but not entirely contiguous; tomentum of segment six ochraceous or fulvous 71

71. Lateral ocelli distinctly nearer eyes than to edge of vertex; carina of segment six definite, with a semicircular median emargination . . . . . *leucostomella* Ckll. (p. 266)
Lateral ocelli at least as near the edge of the vertex as to the eyes; carina of segment six less evident *bertonii* Schrott. (p. 266)

72. Extremely large (18–20 mm.); pubescence entirely deep fulvous . . . . . *cockerelli* Rohwer (p. 292)
Smaller (13 mm. or less); pubescence variable, but not entirely fulvous 73

73. Pubescence of cheeks, vertex, mid and hind legs, and apical segments of abdomen, long and black, elsewhere long and white, at least in part 74
Pubescence of cheeks, legs, etc., mostly pale 75

74. Larger (12 mm.); basal segment of abdomen white pubescent, the following segments entirely and conspicuously black pubescent; dorsum of thorax with intermixed black hairs . . . . . *conferta* n. sp. (p. 292)

Smaller (9–10 mm.); dorsum of thorax and segments one to four of abdomen entirely and conspicuously white pubescent ..... *saulcyi* Guer. (p. 293)

75. Carina of segment six either entire medially or very low, with a barely perceptible median notch 76
Carina distinctly emarginate medially 79

76. Carina consisting of a low indefinite transverse ridge, having a slight median notch 77
Carina low but definite, entire medially 78

77. First abdominal sternite much enlarged, reaching the apical margin of segment two, the margin thickened and densely pubescent (see Pl. XII). *antiqua* n. sp. (p. 270)
First abdominal sternite normal. *montezuma* Cress. (p. 280)

78. Face entirely pale pubescent, without admixed black hairs *abnormis* n. sp. (p. 271)
Face laterally with long black hairs. . *certa* n. sp. (p. 272)

79. Dorsal surface of segment six vertical, usually with dense pale tomentum 81
Segment six more nearly horizontal in position, without pale tomentum 80

80. Legs entirely red ..... *uniformis* Mitch. (p. 281)
Legs black ..... *clara* n. sp. (p. 281)

81. Clypeus entirely covered with uniformly long dense pubescence, entirely hiding the surface 82
At least the upper portion of the clypeus thinly pubescent, so that the surface is partially exposed 85

82. Segment five with thin greyish tomentum and long erect conspicuous black hairs 83
Segment five with bright fulvous tomentum and long erect hairs of the same color, usually without black hairs. 84

83. Punctures of mesonotum relatively sparse, the surface shining between them; segment four with black pubescence ..... *arcus* n. sp. (p. 286)
Punctures of mesonotum very close and fine, the surface not shining; pubescence of segment four entirely pale fulvous or ochraceous ..... *boliviensis* Fr. (p. 285)

84. Pubescence of segments two to four rather pale fulvous, not contrasting with the apical segments *tuxtla* Cress. (p. 287)
Pubescence of segments two to four black at least in part, with white apical fasciae, segments five and six in contrast, with bright fulvous pubescence *ecuadoria* Fr. (p. 287)

85. Surface of clypeus largely exposed, with only an apical fringe of yellow pubescence, with short inconspicuous black pubescence above.....*acerba* n. sp. (p. 266)
Clypeus largely covered with pale pubescence, only the upper margin exposed by the thinning of the pubescence
ardua n. sp. (p. 268)

FEMALES

1. Sixth abdominal sternite bare, except for a basal and apical fringe, with a bare lip projecting beyond the apical fringe.....2
Sixth sternite either densely and uniformly pubescent, or largely bare or thinly pubescent, but without an apical bare lip.....46
2. Mid metatarsi as long as their tibiae; mandibles 5-dentate.3
Either the mid metatarsi shorter than their tibiae, or the mandibles but 4-dentate.....5
3. Pubescence largely black; abdominal sternites not fasciate beneath the scopa.....4
Pubescence largely pale; abdominal sternites with entire conspicuous white apical fasciae
brancoensis n. sp. (p. 187)
4. Scopa largely white, black only on extreme base and on lateral margins of segments.*proserpina* Schrott. (p. 187)
Scopa in large part black laterally and basally
totonaca Cress. (p. 187)
5. Clypeus highly modified, deeply excavated; mandibles each with a basal *superior* tooth..*cordovensis* n. sp. (p. 189)
Clypeus and mandibles ordinary.....6
6. Mesonotum extremely densely punctate throughout, with no evident shining spaces between the punctures....7
Punctures of mesonotum separated to at least some slight degree medially, or else the puncturation obscured by the dense pubescence.....20
7. Apical margin of clypeus entire medially.....8
Apical margin of clypeus either emarginate or denticulate medially.....9
8. Dorsum of thorax entirely covered with rather dense fulvous pubescence.....*timida* n. sp. (p. 194)
Dorsum of thorax with conspicuous black pubescence medially.....*velhoensis* n. sp. (p. 199)
9. Apical margin of clypeus with a slight median emargination; scopa black laterally on segments four and five.....10
Apical margin of clypeus with at least a median denticle; scopa on segments four and five entirely pale.....13

10. Segment six of abdomen with conspicuous erect black hairs basally 11
Erect hairs on segment six entirely pale 12
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simplicipes Fr. (p. 295)

Descriptions and Records

Megachile otomita Cresson (Pls. X, XI and XV)

1878. *Megachile otomita* Cresson, Trans. Am. Ent. Soc., VII, p. 123.
1911. *Megachile otomita* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 258.
1916. *Megachile squamosa* Friese, Stett. Ent. Zeit., LXXI, p. 340.
1920. *Megachile knabi* Cockerell, Proc. U. S. Nat. Mus., LV, p. 215.

San Jose, Costa Rica, May 30, 1903, (J. C. Crawford), [Titus, 1 ♂, 2 ♀]. Mount Redonda, Costa Rica, January 1903, [A. N. S. P., 1 ♂, 1 ♀].

Megachile cartagenensis new species (Pls. X and XI)

Male.—Size: Length, 7 mm.; breadth of abdomen, 2 mm.; anterior wing, 6 mm.

Structure: Length of face subequal to breadth; eyes converging below; apical margin of clypeus beneath beard 3-tuberculate medially, the central tubercle small; mandibles 3-dentate, with an acutely triangular median inferior projection; cheeks narrower than eyes, with a slightly concave bare polished area below, but not protuberant; vertex rounded, the hind margin very slightly concave; lateral ocelli subequally distant from eyes and edge of vertex; antennae long and slender, reaching just beyond the scutellum, basal joint of flagellum hardly as long as the pedicel, the other joints twice as long as broad, the apical one three times as long, but not at all dilated; front coxae with spines very much abreviated, tuberculate; front tarsi slightly dilated, polished and slightly concave beneath; all the legs slender; abdomen parallel-sided, the apical margins of the segments slightly depressed and transparent; segment six ventral in position, the carina hardly noticeable, but definitely emarginate medially, median teeth of apical margin carinate, the lateral ones more acute; segment seven hardly visible; only three abdominal sternites exposed.

Puncturation: Coarse and deep in general; dense on face and clypeus, dense and relatively fine on cheeks, close but not crowded on vertex, mesonotum and scutellum, crowded on pleura above, more sparse below, finer and sparse on abdomen, especially medially, but close on segment five, fine and dense on segment six.

Color: Black in general, including the legs and tegulae; antennae obscurely reddish beneath; wings violaceous, slightly infuscated, somewhat darker apically, the nervures black; abdominal segments with purplish reflections, the transparent apical margins yellowish; spurs pale yellow.

Pubescence: Thin and white in general, rather dense on face; clypeus with a few inconspicuous darker hairs; vertex, mesonotum and scutellum with very thin erect dark pubescence; entirely pale on abdomen, segments five and six with considerable pale tomen-

tum and erect, though short, pale hairs, segments one to three subfasciate laterally, segments three to six with entire white *basal* fasciae; sternites with broad dense apical fasciae.

Type.—Male; Cartagena, Colombia, October 30, 1926, (George Salt), [Salt].

Megachile abacula Cresson

1878. *Megachile abacula* Cresson, Trans. Am. Ent. Soc., VII, p. 130.
1911. *Megachile abacula* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 256.

Mexico, [A. N. S. P., 1 ♂].

Megachile gualanensis Cockerell

1912. *Megachile gualanensis* Cockerell, Ann. Mag. Nat. Hist., (8), x, p. 27.

Gualan, Guatemala, (W. P. Cockerell), [A. N. S. P., 1 ♂ cotype].

Megachile quadridentata new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Length and breadth of face subequal; eyes slightly converging below; apical margin of clypeus with three regular, small but distinct median crenulations, and an indistinct one on either side (quite similar to *haematoxylonae*, Plate XIV; mandibles expanded apically, 4-dentate (much as in *otomita*, Plate XIII), with two sharp ridges parallel to the outer margin, and a third extending from the second tooth obliquely across upper face to base; cheeks slightly narrower than eyes and slightly narrowed above; vertex slightly convex, the hind margin strongly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum very short, distinctly shorter than pedicel, subequal to second joint, the middle joints somewhat longer than broad; all the metatarsi much narrower and shorter than their tibiae, claws without basal teeth; abdomen narrow and parallel-sided, segments two to four with deep basal grooves, the apical margins of the segments strongly depressed laterally, but not medially; segment six abruptly descending, with an abrupt apical lip, the ventral plate densely pubescent throughout.

Puncturation: Deep, close and rather fine on cheeks; coarser and more distinctly separated on vertex; deep, close and coarse on clypeus and supraclypeal area; on mesonotum medially about as on vertex, but closer laterally and anteriorly, as also on scutellum; pleura rather closely and deeply punctate, distinctly and rather finely so on lateral faces of propodeum; fine and close on basal abdominal segments, more sparse but uniform on

segment two, sparse and fine on segments three and four medially, but coarse laterally, close and fine on segment five, and especially so on segment six.

Color: Black; antennae piceous above, reddish below; tegulae piceous; wings hyaline, faintly clouded and violaceous apically, nervures fuscous; hind spurs yellowish, front spurs dark ferruginous.

Pubescence: White on clypeus, face and cheeks, rather dense on inner orbits; thin and ochraceous on vertex; apparently mostly white on thorax (specimen rubbed), with ochraceous or darker hairs on mesonotum and scutellum, and white on legs, yellowish beneath tarsi; discs of abdominal segments largely bare, but with some blackish pubescence evident on segment five, segments one to five with white apical fasciae, but this indefinite on segment five, segments two to four also with the basal grooves white fasciate, segment six with fine subappressed purplish-brown tomentum; scopa creamy-white, purplish-brown on segment six.

Type.—Female; Guadalajara, Mexico, August 16, 1903, (McClendon), [A. N. S. P. no. 4151].

This is distinguished from *exilis, campanulae* and others of this group by the even, shallow crenulations or denticulations of the anterior margin of the clypeus, and the purplish-brown pubescence of segment six.

Megachile haematoxylonae new species (Pl. XIV)

Female.—Size: Length, 9 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 6 mm.

Structure: Length and breadth of facial quadrangle subequal; eyes subparallel; apical margin of clypeus 5-denticulate; mandibles 4-dentate, teeth acute, the two apical ones approximate, with no evident cutting edges; cheeks below very slightly narrower than eyes, and but slightly narrowed above; vertex convex, the hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum shorter than the pedicel, the second joint also shorter than the pedicel, but slightly longer than the basal joint; mid and hind metatarsi much narrower and shorter than the respective tibiae, claws without distinct basal teeth; abdomen narrow and parallel-sided, the hind margins of the segments quite deeply depressed laterally, and segments two to four deeply depressed basally; segment six very slightly concave laterally in dorsal aspect, in profile slightly convex, with an abrupt shelf-like apical lip, the dorsal surface almost vertical in position, the ventral plate uniformly densely pubescent, without a bare apical lip.

Puncturation: Fine and close on cheeks; deep, coarse and distinctly separated on vertex, mesonotum, scutellum and supraclypeal area; much closer on face and clypeus; fine and close on pleura above and in front, but quite coarse, deep and sparse below posteriorly; relatively fine, but deep and sparse on abdomen, but fine and close on segment six and to some degree on segment five.

Color: Black, including tegulae and legs; antennae beneath, more fuscous; wings faintly and rather uniformly infuscated, quite deeply so in radial cell, violaceous apically, the nervures fuscous; spurs yellow.

Pubescence: Thin and rather short in general; whitish on cheeks, pleura, propodeum, legs, and basal segment of abdomen, with dense white patches in front of tegulae and behind each wing base; thin but more fuscous on vertex, mesonotum and scutellum; whitish on face, with intermixed black hairs; very short and largely pale on discs of abdominal segments, segments four to six with erect black hairs, and segment six with a white pilosity in addition; segments one to four with very narrow white apical fasciae, more or less interrupted medially on the basal segments, but segment two to three with thin white fasciae in the basal grooves which give the appearance of a continuous apical fascia on the preceding segment, segment five not fasciate; scopa creamy white, brownish on segment six.

Type.—Female; Mamatoco, Santa Marta, Colombia, February 18, 1927, at flowers of *Haematoxylon*, (M. A. Carriker), [Salt].

Megachile fastidiosa new species (Pl. XIV)

Female.—Size: Length, 13 mm.; breadth of abdomen, 4 mm.; anterior wing, 9 mm.

Structure: Facial quadrangle about as broad as long; eyes parallel; clypeus short and broad, the apical margin slightly rolled, with a denticle toward each side; mandibles 5-dentate, the teeth about equidistant from each other; cheeks slightly broader than eyes, not appreciably narrowed above, the hind margins rounded; vertex slightly convex, the hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex, this distance being relatively great; basal joint of flagellum very slightly longer than either the pedicel or the second joint, these being subequal; mid and hind metatarsi definitely shorter and narrower than the respective tibiae, claws without basal teeth; abdomen long and parallel-sided, the apical margins of the segments rather narrowly depressed for their entire width; dorsal surface of segment six about vertical in position, this segment straight laterally in dorsal aspect except for the concave

tip, and in profile straight, with abundant erect hair visible, the ventral plate densely pubescent throughout and without a bare apical lip.

Puncturation: Fine, close and shallow on cheeks; deeper but very close on face; more definitely separated on vertex, rather widely so laterally; sparse on supraclypeal area; rather coarse and close on clypeus; shallow on mesonotum, scattered medially, close and fine anteriorly and laterally; evenly distributed and rather close on scutellum; fine and close on pleura above, coarse and relatively sparse below; minute and indistinct on basal abdominal segment, becoming distinct, but rather fine and close on the other segments, but segments five and six rugoso-punctate.

Color: Black; antennae and tegulae more piceous; wings lightly infuscated, quite deeply so apically and along costal margin, the nervures piceous; spurs red.

Pubescence: Short and inconspicuous in general; creamy white at sides of face, between antennae, on cheeks, pleura, propodeum and basal segment of abdomen, as also on legs in large part; long, thin and brownish-fuscous on clypeus, vertex and scutellum; mesonotum largely bare, but with a few short inconspicuous dark hairs; discs of abdominal segments two to four with some extremely short blackish pubescence, but largely bare and not at all fasciate; segment six with a fine pale pilosity and numerous erect stiff black hairs; a few erect black hairs on segment five apically; scopa white, but entirely black on segment six.

Type.—Female; Buenavista, Bolivia, [Meyer].

Megachile obdurata new species (Pl. XI)

Male.—Size: Length, 11 mm.; breadth of abdomen, 3 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle much longer than wide; eyes subparallel; apical margin of clypeus beneath beard with a tubercle on each side of middle; mandibles 3-dentate, with a robust subapical inferior projection; cheeks slightly narrower than eyes, with an inferior concave bare area, the lower margin of which is produced into a short triangular projection; vertex very slightly rounded, the posterior margin evenly incurved; lateral ocelli very slightly nearer eyes than to edge of vertex; basal joint of flagellum slightly shorter than the pedicel, the length of the following joints about twice their width, the apical one not appreciably dilated, but slightly elongate; front coxae bare anteriorly, with short acute spines and a small patch of short but robust red bristles; front femora slender, not keeled; front tibiae more robust, but very short; front tarsi broadly dilated, the metatarsus with an anterior much prolonged scale reaching nearly

to the tip of the second joint, this and the following joints much smaller; middle legs slender, the tibiae with the usual apical spur; abdomen parallel-sided, the apical margins of the segments rather narrowly depressed; dorsal surface of segment six vertical in position, with a rather sharp median longitudinal carina, the transverse carina irregularly emarginate or crenulate, scoop-shaped, the apical margin of the segment with hardly evident teeth; segment seven not visible; four ventral plates exposed.

Puncturation: Rather fine and close in general; very fine and crowded on cheeks; more distinctly separated on vertex; rather widely separated on mesonotum medially, otherwise close; close on scutellum; crowded on pleura; close on the basal abdominal segments, but more sparse on the shining apical segments except segment six which is rugoso-punctate and dull.

Color: Black in general; antennae obscurely fuscous below; front and middle tibiae mostly ferruginous, the front tarsi yellowish-ferruginous; mid and hind tarsi reddish; all the femora blackish; tegulae shining fuscous; wings subhyaline, slightly infuscated and violaceous apically, the nervures fuscous; spurs ferruginous.

Pubescence: White on cheeks, sternum, legs and basal abdominal segments; cream-color without black admixture on face and on thorax above, but vertex, mesonotum and scutellum with considerable fuscous hair; segments two to five of abdomen with entire white apical fasciae, segment five with erect ochraceous hairs, without pale tomentum, as also segment six; front tarsi white fringed posteriorly, the fringe tipped with fulvous; mid tarsi not fringed.

Type.—Male; Villarrica, Paraguay, [January ?] 1, 1923, [Meyer].

Megachile cruziana new species (Pls. X and XI)

Male.—Size: Length, 12 mm.; breadth of abdomen, 3 mm.; anterior wing, 8 mm.

Structure: Face somewhat longer than broad between eyes; eyes subparallel; apical margin of clypeus slightly crenulate beneath beard; mandibles 3-dentate, with a robust inferior projection, with the apex slightly nearer the basal end of the mandible than the apical end; cheeks slightly broader than eyes, with a bare polished area and a pyramidal protuberance below; vertex flat, slightly incurved on hind margin; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum subequal in length to pedicel, the middle joints hardly twice as long as broad, the apical one considerably longer and quite strongly dilated and flattened; front coxae flattened, bare and polished,

with a row of three robust reddish bristles on the anterior margin, the spines rather long and slender, slightly curved, the apices divergent; front femora not keeled; front tarsi dilated and flattened, the metatarsi not excavated on the anterior margin, less broadly dilated than the second joint except at the extreme apex; mid tibiae fully twice as long as the mid metatarsi, with the usual apical spur; mid and hind tarsi slender; abdomen parallel-sided, apical margins of segments two to four quite strongly and abruptly depressed; dorsal surface of segment six vertical in position, the carina entire medially, scoop-shaped, the apical margin of the segment with hardly evident teeth; segment seven entirely hidden; four ventral plates evident.

Puncturation: Very fine and close on cheeks, upper pleura and basal abdominal segments; fine but more distinct on vertex; distinctly separated on mesonotum and scutellum; segment five shining, but indistinctly rugoso-punctate apically; segment six dull, finely rugoso-punctate.

Color: Black in general, with the antennae obscurely brownish-ferruginous below; front coxae, trochanters and femora bright ferruginous, the tibiae somewhat infuscated on outer face, but ivory colored apically, the tarsi ivory, very narrowly blackened on the posterior margin; middle legs except the coxae ferruginous; hind legs blackish, tinged with ferruginous; tegulae fuscous; wings slightly infuscated, deeply so in region of radial cell, the nervures fuscous; spurs ferruginous.

Pubescence: Pale ochraceous on face (without any black admixture), thorax except above, and legs; dense and white on cheeks below, otherwise thin and more ochraceous, blackish above; fuscous or black on vertex, mesonotum, scutellum and discs of abdominal segments, mixed with ochraceous on basal segments, the apical fasciae white, evident only laterally, no pale tomentum on the apical segments; front tarsus with a long dense fulvous posterior fringe, and metatarsi with a shorter and somewhat paler anterior fringe; mid and hind tarsi not fringed, covered with silvery pubescence.

Type.—Male; Buenavista, Santa Cruz, Bolivia, 450 m., [Meyer]. *Paratypes.*—3 males; topotypical, [Meyer].

Megachile dentipes Vachal

1909. *Megachile dentipes* Vachal, Rev. Ent., XXVIII, p. 12.
1914. *Megachile dentipes* Cockerell, Ann. Mag. Nat. Hist., (8), XIII, p. 427.
1920. *Megachile poculifera* Cockerell, Proc. U. S. Nat. Mus., LV, p. 217.
1923. *Megachile poculifera* Cockerell, Proc. U. S. Nat. Mus., LXIII, Art. 8, p. 1.
1924. *Megachile poculifera* Cockerell, Proc. Calif. Ac. Sci., (4), XII, p. 546.

Balboa, Canal Zone, March 2, 1923, on Triplaris, [M. C. Z., 1 ♂]. Paraguay, November 1925, [Meyer, 1 ♂]. Guaymas, Mexico, April 15, 1921, (E. P. Van Duzee), [Calif. Ac. Sci., 1 ♂]. Brownsville, Texas, [Univ. Kans., 1 ♂].

Megachile ferruginosa new species (Pls. X and XI)

Male.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face considerably longer than broad; eyes subparallel; apical margin of clypeus quite deeply emarginate medially, with a denticle on each side; mandibles slightly grooved on outer surface apically, with a triangular inferior projection located about a third of the distance from base to apex of mandible; cheeks about as broad as eyes, with a small bare polished area below which is margined behind with a short spine-like projection; vertex slightly rounded, the hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum barely as long as the pedicel, the other joints not quite twice as long as broad, the apical one considerably longer, very slightly dilated and flattened; front coxae bare and polished anteriorly, but with a large patch of robust ferruginous spine-like bristles, with a rather long but slender spine; front femora slender, not keeled; front tarsi broadly dilated, the metatarsus with a conspicuous boat-shaped scale; mid tibiae small, but fully twice the length of the metatarsi, with the usual apical spur; segment six of abdomen with a conspicuous carina which is irregularly emarginate medially and irregularly crenulate laterally; segment seven produced into an acute triangular spine; four ventral plates visible.

Puncturation: Close and fine in general, especially so on cheeks, punctures on the abdomen minute and inconspicuous.

Color: Head and thorax black, abdomen entirely ferruginous; antennae ferruginous; mandibles black; front coxae pale ferruginous, the trochanters black, the femora and tibiae pale ferruginous within, more fuscous on outer faces, the tarsi ivory, but the metatarsal scale brownish-fuscous; mid and hind legs ferruginous, more or less suffused with fuscous; tegulae pale ferruginous-hyaline; wings faintly yellowish, the nervures pale ferruginous; spurs ferruginous.

Pubescence: Ochraceous in general, entirely so on face above clypeus, on vertex, thorax and basal abdominal segments; upper half of clypeus with long erect black hair, contrasting with the dense ochraceous apical beard; pubescence of cheeks whitish, dense below; apical segments of abdomen with erect black hairs; legs with largely pale pubescence, front tarsi with a dense whitish

posterior fringe, mid metatarsi with some blackish pubescence on outer face, and a dense ochraceous posterior fringe; hind metatarsi fringed on both margins with black hairs.

Type.—Male; Buenavista, Santa Cruz, Bolivia, 450 m., [Meyer].

Megachile zaptlana Cresson

1878. *Megachile zaptlana* Cresson, Trans. Am. Ent. Soc., VII, p. 130.
1911. *Megachilae zaptlana* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 260.

Villarrica, Paraguay, January 1922, [Meyer, 2 ♀]. Rio Frio, Magdalena, Colombia, December 26, 1926, (Salt, 1 ♀).

Megachile hilarimorpha Strand (Pls. X, XI and XII)

1910. *Megachile hilarimorpha* Strand, Zool. Jahrb., Abth. f. Syst., XXIX, p. 542.

Chapada, Corumba and Pedra Branca, Brazil, January, April and May, [A. N. S. P., 14 ♂].

Megachile intergradus Mitchell

1929. *Megachile intergradus* Mitchell, Trans. Am. Ent. Soc., LIV, p. 339.

Buenavista, Santa Cruz, Bolivia, (compared with type), [Meyer, 4 ♀].

The clypeus and mandibles are much as in *lorensiensis* (Pl. XIV).

Megachile lorensiensis new species (Pl. XIV)

Female.—Size: Length, 14 mm.; breadth of abdomen, 5.5 mm.; anterior wing, 11 mm.

Structure: Facial quadrangle slightly broader than long; eyes subparallel; clypeus somewhat swollen above, the apical margin broadly incurved, otherwise entire; mandibles 4-dentate, the third tooth broadly truncate, the others acute, a cutting edge between the third and fourth teeth; cheeks below subequal to eyes in width, considerably narrowed above; vertex flat, the hind margin strongly incurved; lateral ocelli nearer edge of vertex than to eyes; basal joint of flagellum about twice the length of the pedicel, somewhat longer than the second joint; scutellum flattened dorsally, the hind margin slightly protuberant medially; mid and hind metatarsi subequal in width to the respective tibiae and but slightly shorter; claws with small seta-like basal teeth; abdomen broadly cordate, the hind margins of the segments broadly and quite deeply depressed except for a narrow median area; segment six very slightly concave laterally in dorsal aspect, straight in profile, with numerous long erect hairs visible, the ventral plate largely bare, with a narrow inconspicuous bare apical lip.

Puncturation: Fine and close on cheeks, extremely so on face; irregularly scattered on the shining clypeus and supraclypeal area; sparse on vertex, especially laterally; fine and close on mesonotum anteriorly, becoming minute, indistinct and irregularly scattered on the polished median and posterior area; upper surface of scutellum polished and almost impunctate; fine and densely crowded on pleura above, coarser and definitely separated below; fine and close on abdomen, but each segment with narrow impunctate areas just anterior to the depressed margins.

Color: Black; antennae beneath more fuscous; tegulae bright ferruginous except for an anterior darkened area; wings lightly infuscated, slightly darker on costal margin of radial cell, the nervures ferruginous to fuscous; legs considerably suffused with red, the hind tibiae and tarsi being entirely ferruginous; spurs pale yellow.

Pubescence: Whitish on face below level of antennae, on cheeks, sternum, lateral faces of propodeum, and legs in part; fuscous on vertex and in front of anterior ocellus, on pronotum including tubercles, on mesonotum, scutellum, and basal segment of abdomen, and a large fuscous patch covering most of the surface of each pleuron, a dense tuft of long fuscous hairs just behind each wing base; posterior face of propodeum with mixed light and dark hairs; discs of segments two to five with short but rather dense black pubescence, all of these with dense orange apical fasciae, that on segment one narrow, but those on all the others very broad and conspicuous, and segment six with dense orange tomentum and erect black hairs; scopa entirely orange.

Type.—Female; Mount San Lorenzo, Santa Marta, Colombia, 4500 ft., January 1, 1923, (M. A. Carriker), [Salt]. *Paratypes.*—1 ♀, topotypical, at 2500 ft., December 29, 1922; 1 ♀, Cincinnati, Santa Marta, January 1, 1923, [Salt].

This is very close to *M. intergradus* Mitchell, but differs in the orange color of the scopa and abdominal bands and in the more general distribution of black pubescence. In *intergradus* the scopa and abdominal bands are pale ochraceous and there is no black pubescence on the propodeum, behind the wings or on the basal abdominal segment.

Megachile imperator new species (Pls. X and XI)

Male.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 9 mm.

Structure: Facial quadrangle longer than broad; eyes slightly converging below; apical margin of clypeus entire; mandibles 4-dentate, each with a long narrow acute basal inferior projection,

the upper surface with conspicuous carina-like tubercles; cheeks as broad as eyes, the inferior angle with a short pyramidal projection; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum fully twice the length of the pedicel, the following joints three times the length of the pedicel, the apical one not dilated; front coxae bare anteriorly, without any red bristles, the spines broad and flat, rounded apically; front femora strongly keeled apically; front tarsi broadly dilated, the metatarsi excavated anteriorly; mid tibiae longer than the metatarsi, with the usual apical spur; hind femora considerably swollen, the tibiae long and slightly bowed, the metatarsi short; abdomen short, broad and parallel-sided, the apical margins of the segments slightly depressed; dorsal surface of segment six vertical in position, the carina rather prominent, roundly emarginate medially, entire laterally, apical margin with the median teeth carinate and very low, the lateral teeth acute and more prominent; segment seven inevident; four sternites exposed.

Puncturation: Fine and close in general; relatively coarse and distinct on vertex; fine and indistinct on cheeks; densely crowded on mesonotum, scutellum and pleura; minute and dense on basal abdominal segments, becoming more sparse on segment five; minute, shallow and indistinct on segment six on which there are also scattered minute tubercles; punctures on legs in general sparse and minute, on tegulae minute and close.

Color: Black; antennae brownish-ferruginous; mandibles suffused with red; legs entirely pale ferruginous, the keel of the front femur more yellowish; wings slightly infuscated, more so apically, the nervures ferruginous; basal abdominal segment suffused with ferruginous; spurs pale yellow.

Pubescence: Ochraceous on head and thorax, without black admixture; more reddish on thorax above, paling to whitish below; whitish on cheeks; long, dense and ochraceous on segments one and two of abdomen, black on discs of segments three and four, but these with basal appressed ochraceous tomentum; segment five with appressed ochraceous tomentum on basal half, and erect black hairs; segments one to five with entire ochraceous apical fasciae; segment six with scattered long erect dark hairs, without pale tomentum; front tarsi with white posterior fringes, tipped with brown, and brownish beneath, more fulvous basally; mid metatarsi with long thin white posterior hair fringes.

Type.—Male; Chapada, Brazil, November, (H. H. Smith), [A. N. S. P., no. 4136]. *Paratypes.*—5 ♂, topotypical, October, November and March, [A. N. S. P.].

Megachile vernoniae Schrottky

1913. *Megachile vernoniae* Schrottky, Rev. Mus. Paulista, IX, p. 203.

Chapada and Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P., 6 ♂]. Buenavista, Bolivia, [Meyer, 1 ♂].

Megachile proserpina Schrottky

1902. *Megachile nudiventris* Schrottky (nec Smith), Rev. Mus. Paulista, v, p. 439.
1908. *Megachile proserpina* Schrottky, An. Soc. Cient. Argen., LXV, p. 233.
1913. *Megachile proserpina* Schrottky, Rev. Mus. Paulista, IX, p. 156.

Chapada and Pedra Branca, Brazil, November, December and April, (H. H. Smith), [A. N. S. P., 12 ♀]. Buenavista, Bolivia, [Meyer, 12 ♀].

This is very similar to *totonaca* Cresson, and may possibly be only a color variety. The mandibles are somewhat similar to *brancoensis* (Pl. XIV).

Megachile totonaca Cresson

1878. *Megachile totonaca* Cresson, Trans. Am. Ent. Soc., VII, p. 117.
1911. *Megachile totonaca* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 259.
1923. *Megachile totonaca* Cockerell, Proc. U. S. Nat. Mus., LXIII, Art. 8, p. 1.

Chichen Itza, Yukatan, (E. Thompson), [Titus, 1 ♀].

Megachile brancoensis new species (Pl. XIV)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4.25 mm.; anterior wing, 9 mm.

Structure: Length and breadth of face subequal; eyes slightly converging below; apical margin of clypeus straight; mandibles 5-dentate, the two apical teeth and the three inner ones approximate, a long cutting edge between the second and third; cheeks below broader than eyes, slightly narrowed above; vertex slightly convex, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to the second joint, slightly longer than the pedicel; mid and hind metatarsi slightly shorter and considerably narrower than the respective tibiae; claws with minute basal teeth; abdomen broadly cordate, considerably flattened, the hind margins of the segments slightly depressed laterally but not medially; segment six nearly straight laterally in dorsal aspect, straight in profile with numerous erect hairs visible, the ventral plate largely bare, with a bare apical lip.

Puncturation: Fine and close on cheeks above, sparse and quite coarse below; fine and close on vertex and on clypeus laterally and on upper margin, but scattered medially; more coarse on supraclypeal area; moderately coarse on mesonotum, close except

on median posterior portion; somewhat finer and more sparse on scutellum; densely crowded and rather coarse on pleura; very fine, close and indistinct on basal segments of abdomen, becoming more coarse and distinctly separated on segment five, very minute and crowded on segment six.

Color: Black; mandibles red on apical half except for the black dentate margin; antennae beneath, tegulae and femora in large part ferruginous, the other leg joints more piceous; spurs yellowish; wings dilute yellowish, the nervures more ferruginous.

Pubescence: Whitish between antennae, on cheeks, pleura and basal leg joints; pale ochraceous at sides of face, on propodeum and on basal segments of abdomen; brighter ochraceous on vertex, mesonotum, scutellum and apical leg joints; clypeus with thin appressed golden hairs and scattered longer erect dark hairs; discs of segments two to five of abdomen with very short blackish pubescence and entire narrow whitish apical fasciae; segment six with appressed whitish tomentum and longer erect whitish hairs, without black admixture; scopa silvery white, mostly black on segments five and six, sternites two to five with broad entire conspicuous white apical fasciae beneath the scopa.

Type.—Female; Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4141]. *Paratypes.*—1 ♀, Carino, Rio Branco, Amazonas, August 31, 1924; 1 ♀, Buenavista, Bolivia, [Meyer]. 1 ♀, Chapada, Brazil, January, (H. H. Smith), [A. N. S. P.].

This species is apparently rather variable, as the specimen from Chapada has broader, more ochraceous or fulvous abdominal fasciae, but appears to be more a variant of the species, rather than a distinct species.

Megachile illustris new species (Pls. X, XI and XII)

Male.—Size: Length, 12 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle longer than broad; eyes slightly converging below; apical margin of clypeus with a slight median emargination; mandibles 4-dentate, with a robust basal inferior projection which is polished and truncate apically, the inferior margin of the mandible slightly angulate medially; cheeks as broad as eyes, the posterior margin slightly angulate, with a bare polished area below, this area tuberculate on the hind margin; vertex flat, the hind margin slightly incurved; lateral ocelli nearer the eyes than to edge of vertex; basal joint of flagellum about twice the length of the pedicel, the following joints twice as long as broad, the apical one broadly dilated and flattened; front coxae bare and polished anteriorly, without red bristles, the spines

flattened, broad basally, tapering apically; front trochanters with a very short inconspicuous spine on the apical angle; front femora slightly keeled beneath apically, margin between the upper and antero-inferior faces rather sharply carinate basally; front tarsi dilated, the metatarsi long, more broadly dilated apically, but not much produced, deeply excavated anteriorly; mid tibiae longer than the metatarsi, without an apical spur, but with a slight apical protuberance; hind legs normal; abdomen broad and rather short, apical margins of the segments depressed; dorsal surface of segment six vertical in position, the carina prominent, roundly emarginate medially, median teeth of the apical margin broadly carinate, the lateral ones vestigial; segment seven barely visible; four ventral plates visible.

Puncturation: Fine and densely crowded on cheeks, vertex, mesonotum, scutellum, pleura and basal segments of abdomen, becoming coarser and more distinctly separated on apical abdominal segments; minute and rather close on tegulae; rather sparse on legs.

Color: Black in general; antennae brownish; mandibles red below, and labrum red; coxae and trochanters blackish, legs otherwise ferruginous, but the front tarsi yellow, and the inner faces of the front femora and tibiae ivory; tegulae ferruginous; wings subhyaline, the nervures ferruginous; spurs pale yellow.

Pubescence: Entirely pale, with no black admixture; white on cheeks, sternum and venter of abdomen, dense on cheeks below; ochraceous on face, pleura and legs, dense on face; long and more fulvous on vertex, thorax above, and basal abdominal segments; shorter and somewhat darker on discs of apical abdominal segments; segments two to four with entire conspicuous ochraceous apical fasciae; segment five fasciate only at extreme sides; segments three to five with ochraceous tomentum basally, and segment six largely covered with it; front tarsi with pale ochraceous posterior fringes, tipped with brownish; mid metatarsi with very long thin posterior fringes of the same color.

Type.—Male; Chapada, Brazil, March, (H. H. Smith), [A. N. S. P., no. 4142].

Megachile cordovensis new species (Pl. XIII)

Female.—Size: Length, 14 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Face much broader than long; eyes parallel; clypeus extremely short medially, the thickened apical margin with a deep median excavation and a more shallow excavation on each side, these separated by pronounced ridges, the lateral angles of upper face of clypeus produced somewhat over the bases of the

mandibles, the apical margin triangularly pointed medially, the lower margin of the median excavation deeply incurved; mandibles 4-dentate, the teeth acute, cutting edges between the second, third and fourth teeth, base with a robust superior flared projection extending beyond the tips of the lateral angles of the clypeus; cheeks below broader than eyes, somewhat narrowed above; vertex slightly convex, hind margin slightly incurved; lateral ocelli much nearer to eyes than to edge of vertex; basal joint of flagellum but slightly longer than the pedicel and the second joint, these latter being subequal; mid and hind metatarsi shorter and narrower than the respective tibiae; claws with sharp basal teeth; abdomen rather ovoid, hind margins of the segments quite strongly depressed laterally, but not medially; segment six nearly straight laterally in dorsal aspect, in profile very nearly straight with suberect hairs visible, the ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Fine and close on cheeks above, coarse and scattered below; rather fine and quite close on vertex medially, more coarse and sparse laterally, with a small median impunctate area on hind margin; coarse and contiguous on upper face of clypeus; rather fine and close but distinctly separated on mesonotum and scutellum; fine and close on pleura above, more coarse below; fine and rather close on discs of abdominal segments basally, becoming more coarse and scattered toward the apical margin of each segment; very minute and crowded on segment six.

Color: Black; antennae obscurely brownish beneath; tegulae blackish or fuscous; wings subhyaline, slightly infuscated apically, the nervures fuscous; spurs yellowish-ferruginous.

Pubescence: Creamy white on cheeks, around the pronotal tubercles and tegulae, on propodeum and basal segment of abdomen; whitish intermixed with fuscous hairs on face laterally and between antennae; fuscous or blackish on clypeus, vertex, mesonotum, scutellum, pleura, sternum, legs in large part, and short and black on discs of abdominal segments; scutello-mesothoracic suture whitish fasciate, and segments one to five of abdomen with entire creamy-white apical fasciae; segment six with brownish tomentum, intermixed laterally with some greyish tomentum, with erect black hairs visible at sides toward base; scopa ochraceous, becoming somewhat fulvous apically, a few blackish hairs on segment six.

Type.—Female; Cordova, Argentina, (Davis), [M. C. Z., no. 16209]. *Paratype.*—1 ♀, Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P.].

Megachile pulchra Smith

1879. *Megachile pulchra* Smith, Descr. N. Sp. Hymen. Brit. Mus., p. 70.
1905. *Megachile pulchra* Cockerell, Trans. Am. Ent. Soc., xxxi, p. 340.
1913. *Megachile pulchra* Schrottky, Rev. Mus. Paulista, ix, p. 159.
1920. *Megachile pulchra* var. *cachoeirensis* Schrottky, Rev. Mus. Paulista, xii, p. 207.

Buenavista, Dep. Sta. Cruz, Bolivia, 450 m., [Meyer, 2 ♂, 2 ♀].

The front tarsi of the male are somewhat similar to *prietana* (Pl. XI), and the clypeus and mandible of the female resemble those of *santaremensis* (Pl. XIII).

Megachile prietana new species (Pls. X, XI and XII)

Male.—Size: Length, 11 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle about as broad as long; eyes subparallel; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with a basal inferior projection which is deeply grooved between its apex and the base on the mandible; cheeks subequal in width to eyes, with a deep concavity and a broad flattened triangular projection at the inferior angle; vertex very nearly flat, hind margin very slightly incurved; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum twice as long as pedicel, the succeeding joints only slightly longer, the apical one only slightly dilated and flattened; front coxae bare and polished anteriorly, with rather broad, flattened, slightly curved spines and a small tuft of reddish bristles of about half the length of the spines immediately beside each spine; front femora rather slender, but distinctly keeled beneath apically; front tarsi broadly dilated, the metatarsus with a large hollow scale-like anterior projection which is narrowly produced apically to the tip of the second joint; mid tibia longer than the metatarsus, produced apically into a rather short blunt spine, without an apical spur; hind femora angulate on lower margin one third of the length from the apex, the tibia slightly longer and somewhat bowed; abdomen parallel-sided, the segments narrowly depressed apically; dorsal surface of segment six vertical in position, the carina low but evident, roundly emarginate medially, median teeth of the apical margin of the segment inevident, the lateral ones barely evident; segment seven with a flattened ventral surface, not spined; four sternites visible.

Puncturation: Close and rather fine in general; shallow and close on cheeks; more distinctly separated on vertex, scutellum and pleura; crowded on mesonotum; fine and close on abdomen throughout; minute and close on tegulae; mid and hind tibiae polished and impunctate on outer faces apically.

Color: Black in general; antennae (including scape), mandibles (except margins of teeth), legs, tegulae, and basal segments of abdomen beneath, ferruginous; front tarsi more yellowish or amber, but the metatarsal scale ferruginous apically; wings slightly yellowish, the nervures pale brownish-yellow.

Pubescence: Pale ochraceous above on head, thorax, and abdominal segments one to four; silvery white between antennae; black on upper portion of clypeus; whitish on cheeks where it is dense below, and white on pleura and legs; segment five with intermixed short whitish and longer black pubescence; segment six with rather dense appressed white tomentum and scattered erect black and white hairs; segments one to five with entire dense ochraceous apical fasciae; front tarsus with a rather short posterior fringe of fulvous and whitish hairs, and mid metatarsus with a thin white posterior fringe.

Type.—Male; Prieta, Republic of Honduras, April 7, 1924, [Meyer]. *Paratype.*—1 ♂, topotypical, [Meyer].

Megachile curvipes Smith (Pls. X, XI and XII)

1853. *Megachile curvipes* Smith, Cat. Hym. Brit. Mus., I, p. 187.
1909. *Megachile curvipes* Vachal, Rev. d'Ent., XXVIII, p. 17.
1913. *Megachile curvipes* Schrottky, Rev. Mus. Paulista, IX, p. 200.

Chapada and Pedra Branca, Brazil, November, January–April, (H. H. Smith), [A. N. S. P., 30 ♂]. Rio Frio, Magdalena, Colombia, January 9, 1927, (Salt, 1 ♂).

This is very similar to *prietana* but differs in the following respects: Mandibles blackish; first joint of flagellum only half the length of the second; segments three to six of abdomen largely black pubescent on discs, and segment five lacking the apical fascia; segment six with a rather large and deep median concavity just above carina.

Megachile furcata Vachal (Pls. X, XI, XII and XIII)

1909. *Megachile furcata* Vachal, Rev. d'Ent., XXVIII, p. 10.

Rio Frio, Clenaga and Tucurinca, Magdalena, Colombia, November–May and August, on flowers of *Tribulus cistoides*, [Salt, 3 ♂, 13 ♀].

Correlation of the sexes of this species was made possible because of its close affinity with *M. pruina* Smith and *M. sidalceae* Cockerell from North America; and since the female has never been noted before, it is described in detail.

Female.—Size: Length, 12 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Facial quadrangle slightly longer than broad; eyes slightly converging below; apical margin of clypeus with a slight median denticle, otherwise entire; mandibles 4-dentate, the two apical teeth approximate, the other two rather distant, with cutting edges between the second, third and fourth teeth; cheeks below subequal to eyes in width, slightly narrower above; vertex flat, hind margin strongly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum almost twice the length of the pedicel, slightly longer than joint two; mid and hind metatarsi slightly shorter and narrower than the respective tibiae; claws with very fine basal teeth; abdomen cordate, the apical margins of the segments strongly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with numerous suberect hairs visible, the ventral plate largely bare, with a definite bare apical lip.

Puncturation: Fine and rather close on cheeks, face and vertex medially, more sparse and irregular on vertex laterally; more coarse on clypeus, rather scattered medially, the supraclypeal area largely impunctate medially; fine and rather close on mesonotum anteriorly, more widely separated posteriorly and on scutellum; fine and close on pleura above, coarser and more definitely separated below; very fine and quite close on abdomen basally, becoming coarse and more widely spaced apically, but segment six very closely punctate.

Color: Black; antennae obscurely ferruginous beneath; tegulae more fuscous, yellowish on anterior margin; wings subhyaline, faintly clouded apically, the nervures fuscous; spurs yellowish.

Pubescence: Pure white on face, clypeus, cheeks, pleura, propodeum, basal segment of abdomen, and legs in large part, densely so at sides of face, between antennae, on cheeks, around pronotal tubercles, and a white tuft at each posterior lateral angle of mesonotum; black on vertex, disc of mesonotum, scutellum, and discs of segments two to five of abdomen; more fuscous on sternum and on outer face of front tibia; brownish on outer face of mid metatarsus; scutello-mesothoracic suture white fasciate; abdominal segments one to five with entire dense white apical fasciae; segment six with whitish appressed tomentum and erect black hairs; scopa pure white, black on segment six, and a few apical black hairs on segment five laterally.

Megachile chapadiana Mitchell

1929. *Megachile chapadiana* Mitchell, Trans. Am. Ent. Soc., LIV, p. 346.

Buenavista, Santa Cruz, Bolivia, [Mitchell, 1 paratype ♂].

Megachile timida new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 7 mm.

Structure: Facial quadrangle slightly broader above than it is long; eyes slightly converging below; apical margin of clypeus entire, very slightly incurved; mandibles 4-dentate, the two apical teeth approximate, with cutting edges between the second, third and fourth; cheeks slightly narrower than eyes, not much narrowed above; vertex flat, hind margin strongly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum about twice the length of the pedicel, the second joint only slightly longer than the pedicel, the following joints gradually increasing in length to the apical one; mid and hind metatarsi only slightly shorter and narrower than the respective tibiae, mid tarsal joints with the apical fringe of red bristles beneath; claws with acute basal teeth; abdomen cordate, the hind margins of the segments but very slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect and in profile, with suberect hairs visible in profile, the ventral plate bare on apical half, with a bare apical lip.

Puncturation: Fine and close on head except on clypeus and supraclypeal area, where the punctures are much coarser and are sparse medially; crowded on thorax, finely so above, more coarsely so on pleura; minute and dense on abdomen throughout.

Color: Black; antennae, legs and tegulae clear ferruginous; wings faintly yellowish, with ferruginous nervures; spurs yellowish-ferruginous.

Pubescence: Fulvous on vertex and on thorax above, quite dense on the latter, fading to pale ochraceous on face, clypeus, cheeks, pleura, sternum, legs, and basal segments of abdomen, without black admixture; discs of segments three to five, and segment two laterally with short black pubescence, but this interrupted on segments four and five by dense yellow tomentum medially; segments two to five with broad entire dense yellow apical fasciae; segment six with much suberect black pubescence and thin inconspicuous silvery pruinosity; scopa white on segments two to four, black on segments five and six, and also on segments three and four at extreme sides.

Type.—Female; Chapada, Brazil, January, (H. H. Smith), [A. N. S. P., no. 4140].

Megachile santaremensis new species (Pl. XIII)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Facial quadrangle about as broad as long; eyes very slightly converging below; apical margin of clypeus subemarginate medially; mandibles 4-dentate, teeth acute, the three apical ones approximate, cutting edges between the second, third and fourth; cheeks below as broad as eyes, narrower above; vertex flat, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum slightly longer than the second joint, and this slightly longer than the pedicel; mid and hind metatarsi shorter than the respective tibiae, the hind ones fully as wide as the tibiae; claws with minute seta-like basal teeth; abdomen broadly cordate, the hind margins of segments three to five narrowly depressed; segment six straight laterally in dorsal aspect, in profile straight with erect hairs visible basally, ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Shallow on cheeks, rather sparse below, close and fine on vertex and face, more coarse and sparse on the shining clypeus and supraclypeal area; fine and close, but not densely crowded, on mesonotum; fine and quite sparse on scutellum; close on pleura, fine above, more coarse below; fine on abdomen, rather close laterally, but more sparse medially, minute and close on segment six.

Color: Black; antennae and tegulae bright ferruginous; legs reddish-ferruginous; mandibles deep red apically except the dentate margin; wings yellowish, the nervures yellowish-ferruginous; spurs yellowish.

Pubescence: Whitish on face laterally and between antennae, on cheeks, pleura, sternum, propodeum, basal segments of abdomen, and legs in large part; fuscous on clypeus; pale ochraceous on vertex, which is also covered with fine appressed ochraceous tomentum, as also on dorsum of thorax, more fulvous just above wing bases; short and inconspicuous but mostly whitish on abdomen, a few black hairs evident laterally and on apical segments; segments two to five with narrow entire white apical fasciae; segment six with appressed whitish tomentum and basal erect black hairs; scopa white basally and medially, black laterally on segments three and four, mostly black on segments five and six, and segment five showing evidences of an apical white fascia beneath the scopa.

Type.—Female; Santarem, Brazil, (H. H. Smith), [A. N. S. P., no. 4139]. *Paratypes*.—2 ♀, topotypical; 1 ♀, (locality indecipherable), April, [A. N. S. P.].

Megachile fossoris Smith (Pl. XIII)

1879. *Megachile fossoris* Smith, Descr. N. Sp. Hym. Brit. Mus., p. 75.
1908. *Megachile fossoris* var. *leucocentra* Schrottky, An. Soc. Cien. Argentina, LXV, p. 236.
1913. *Megachile fossoris leucocentra* Schrottky, Rev. Mus. Paulista, IX, p. 165.
1920. *Megachile fossoris* Schrottky, Rev. Mus. Paulista, XII, p. 198.
1920. *Megachile fossoris leucocentra* Schrottky, Rev. Mus. Paulista, XII, p. 236.

Chapada and Pedra Branca, Brazil, March and April, (H. H. Smith), [A. N. S. P., 14 ♀]. Villarrica, Paraguay, December and January, [Meyer, 4 ♀]. Compared with type (Waterston).

Megachile azteca Cresson (Pl. XIII)

1878. *Megachile azteca* Cresson, Trans. Am. Ent. Soc., VII, p. 119.
1896. *Megachile rhodopus* Cockerell, Ann. Mag. Nat. Hist., (6), XVIII, p. 287.
1911. *Megachile azteca* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 245.
1911. *Megachile rhodopus* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 245.

Mexico, [A. N. S. P., 1 ♀]. Buenavista, Dep. Sta. Cruz, Bolivia, [Meyer, 12 ♀]. Mount Redondo, Costa Rica, [A. N. S. P., 1 ♀].

Megachile hoffmannseggiae Joergensen

1912. *Megachile hoffmannseggiae* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 130.
1927. *Megachile hoffmannseggiae* var. *hypoleuca* Cockerell, Ann. Ent. Soc. Am., XX, p. 395.

Carcarana, Argentina, [A. N. S. P., 1 ♀].

The clypeus and mandibles resemble *morosa* (Pl. XIII).

Megachile inscita new species (Pls. X, XI, XII)

Male.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7.5 mm.

Structure: Facial quadrangle longer than broad; eyes slightly converging below; apical margin of clypeus with a shallow median emargination, otherwise entire; mandibles 4-dentate, the inferior projection basal, with an acute angle in center of lower margin; cheeks as broad as eyes, with a low pyramidal projection on lower angle, but this area thinly pubescent; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum definitely longer than the pedicel, the following joints twice as long as broad, the apical one three times as long but not dilated; front coxae bare anteriorly, with a small obscure patch of ferruginous bristles near the base of the short spine; front femora keeled beneath apically, and the upper margin of the posterior face apically sharply carinate; front tarsi dilated, the metatarsus equal to joints two to four in

length, excavated on anterior margin; mid tibiae slightly longer than the metatarsi, terminated by a rather blunt spine, without the usual spur; hind tarsi slender; abdomen with apical margins of segments depressed; dorsal surface of segment six vertical in position, the carina conspicuous, quite evenly and deeply emarginate medially, very slightly crenulate laterally, median teeth of apical margin inevident, the lateral teeth minute but acute; four sternites visible.

Puncturation: Very close and fine throughout; minute and dense on cheeks; more coarse and distinct on vertex; dense on mesonotum with intervening spaces barely evident; minute but not crowded on abdomen.

Color: Black in general; antennae brownish beneath; front femora pale ferruginous except for the apical half of the posterior face; front tibiae blackish on outer face, yellowish-ferruginous on the two inner faces; all the tarsi pale yellow, the mid and hind ones narrowly rimmed with black posteriorly; tegulae fuscous; wings subhyaline, the nervures fuscous to ferruginous; spurs pale yellow.

Pubescence: White on cheeks, legs, pleura, propodeum, and basal segment of abdomen; blackish on vertex, mesonotum, scutellum and discs of segments two to five of abdomen; cream-color on face, without black admixture; scutello-mesothoracic suture white fasciate and a small white tuft behind each tegula; abdominal segments two to five with entire cream-colored apical fasciae, segment five with thin but evident creamy tomentum and conspicuous erect black hairs; segment six above densely covered with creamy tomentum, entirely hiding the surface, with a very few erect dark hairs; front tarsus with a white posterior fringe, this blackish beneath; mid tarsus also with a thinner white posterior fringe.

Type.—Male; Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4146]. *Paratypes*.—5 ♂, topotypical, [A. N. S. P.].

Megachile agrestis new species (Pls. X, XI and XII)

Male.—Size: Length, 10 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Facial quadrangle longer than wide; eyes slightly converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with a robust basal inferior projection, the lower margin acutely and strongly angulate or toothed medially; cheeks subequal in width to eyes, slightly protuberant below; vertex flat, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex;

basal joint of flagellum considerably longer than the pedicel, the following joints twice the length of the pedicel, the apical one not dilated; front coxae bare anteriorly, with a rather obscure patch of ferruginous bristles at the base of the moderately long and slender spines; front femora keeled beneath apically, the upper margin of the posterior face acute but hardly carinate; front tarsi broadly dilated, the metatarsus almost as long as the other joints combined, deeply excavated anteriorly, only slightly produced apically; mid tibia longer than the metatarsus, without an apical spur, but with a rather robust apical spine-like projection; abdomen rather long and parallel-sided, the apical margins of the segments narrowly but deeply depressed; dorsal surface of segment six almost vertical, the carina prominent, evenly rounded on each side of the broad semicircular median emargination, apical margin of the segment with inconspicuous carinate median teeth, the lateral teeth acute and relatively conspicuous; segment seven conspicuous, with a sharply carinate apical margin; four sternites exposed.

Puncturation: Very fine, shallow and close on cheeks; fine and close on mesonotum; somewhat more sparse on scutellum; rather widely separated on vertex; very close but more coarse on pleura; fine and close on basal segments of abdomen, becoming more sparse on the shining apical segments, but segment six finely rugoso-punctate; femora polished, with only widely scattered punctures, the tibiae more closely and regularly punctured.

Color: Black; antennae more piceous below; mandibles reddened apically; front trochanters and femora largely reddish-yellow, outer faces of femora apically blackish except for the yellow keel; front tibiae blackish on outer face except the yellow apex, reddish-yellow on the two inner faces; mid tibiae also yellow at extreme apex; all the tarsi yellow, but the mid and hind ones edged with black posteriorly; tegulae bronzy-ferruginous; wings subhyaline, somewhat infuscated apically, nervures ferruginous to fuscous; spurs yellow.

Pubescence: Entirely pale ochraceous, without black admixture, on head, thorax, legs, and basal segments of abdomen; more whitish and dense on cheeks below; thin and more silvery on apical abdominal segments, without any definitely black pubescence and without appressed tomentum; segments one to five with entire, narrow, pale, apical fasciae, more ochraceous on basal segments, but becoming white apically; front tarsal fringe white above, more ferruginous beneath; mid and hind tarsal fringes thin and entirely silvery-white.

Type.—Male; Cordova, Argentina, (Davis), [M. C. Z., no. 16200].

Megachile argentina Friese

1906. *Megachile argentina* Friese, Flora o. Fauna, (Silkeborg), III, p. 95.
1908. *Megachile argentina* Friese, Apid. v. Argentina, (Silkeborg), p. 65.
1909. *Megachile argentina* Joergensen, D. Ent. Zeitschr., 1909, p. 214.
1912. *Megachile argentina* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 125.
1912. *Megachile argentina* var. *versicolor* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 132.

San Juan, Argentina, March 4, 1914, [Titus, 6 ♀].

Megachile pollinosa Spinola (Pls. X, XI and XIII)

1851. *Megachile pollinosa* Spinola, Hist. Fis. Chile, Zool., VI, p. 178.
1904. *Megachile pollinosa* Friese, Zeitschr. Syst. Hym. Dipt., IV, p. 186.
1905. *Megachile pollinosa* Cockerell, Trans. Am. Ent. Soc., XXXI, p. 338.
1905. *Megachile pollinosa* Friese, Zeitschr. Syst. Hym. Dipt., V, p. 138.
1909. *Megachile pollinosa* Vachal, Rev. d'Ent., XXVIII, p. 14.
1917. *Megachile pollinosa* Herbst, D. Ent. Zeitschr., 1917, p. 268.

Santiago, Chile, [Mitchell, 5 ♂, 8 ♀].

Megachile velhoensis new species (Pls. X, XII and XIII)

Male.—Size: Length, 10–11 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7.5 mm.

Structure: Face longer than broad; eyes slightly converging below; apical margin of clypeus entire; mandibles 4-dentate, the inferior projection basal, acute, with a mere suggestion of an angle toward the apex of the mandible; cheeks subequal in width to eyes; vertex flat, posterior margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum almost twice the length of the pedicel, but very slightly shorter than the second or following joints, the apical one neither dilated nor flattened; coxal spines of moderate length, flattened; front femora keeled beneath apically, slightly carinate above this keel; front tarsi broadly dilated, anterior margin of the metatarsus excavated, about equal in length to the three following joints combined; mid tibia with an apical spine-like projection, but lacking the usual apical spur; apical margins of abdominal segments hardly depressed medially, but distinctly depressed laterally; segment six vertical in position, the carina low, but with a distinct median circular emargination, apical margin of the segment with very low carina-like median teeth, the lateral teeth acute; segment seven hardly visible; four sternites exposed.

Puncturation: Fine and close throughout, densely crowded on vertex, mesonotum and basal abdominal segments, segment six slightly more coarsely rugoso-punctate.

Color: Black; antennae ferruginous beneath; coxae black; trochanters black except front pair, which are yellowish, with

the femora and tibiae ferruginous; all the tarsi yellow; tegulae blackish; wings lightly infuscated, more deeply so apically, the nervures piceous.

Pubescence: Pale yellowish on head, thorax and basal segments of abdomen; more whitish on pleura and legs; a slight admixture of fuscous in center of mesonotum; front tarsal fringes brownish-yellow, tipped with brown, mid tarsal fringe white; discs of abdominal segments three and four with black pubescence, that on segments five and six largely pale; segments one to five with entire conspicuous yellow apical fasciae.

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Length of face about equal to breadth above; eyes slightly converging below; apical margin of clypeus minutely denticulate medially; mandibles 4-dentate, cutting edges between the second, third and fourth teeth; cheeks hardly as broad as eyes; vertex flat, hind margin slightly incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum twice the length of the pedicel, and slightly longer than the second joint; hind metatarsi about as broad and but slightly shorter than their tibiae; claws with sharp basal teeth; abdomen cordate, apical margins of the segments not at all depressed medially and but slightly so laterally; segment six straight in profile, slightly concave laterally in dorsal aspect, the ventral plate bare except for the marginal fringe, with a bare lip projecting beyond the apical fringe.

Puncturation: Relatively coarse and distinct on clypeus, more distinctly separated medially, as also on vertex; fine and densely crowded on cheeks and on dorsum of thorax; more coarse and sparse on pleura and sternum; minute and close on abdomen throughout.

Color: Black; antennae dull ferruginous below; legs ferruginous except for the black coxae and trochanters; tegulae black, with a pale anterior rim; wings lightly infuscated, more deeply so apically, the nervures piceous.

Pubescence: Yellowish on face, pleura above, margins of mesonotum, propodeum, and basal segment of abdomen; scutello-mesothoracic suture conspicuously yellowish-fasciate; whitish on cheeks, pleura below and legs; blackish on vertex, mesonotum, scutellum, and discs of abdominal segments two to five; segments one to five with entire conspicuous yellowish apical fasciae; segment six with greyish tomentum, becoming dark along the median line, with erect black hairs toward the sides; scopa white, black at extreme sides of segments four and five, and largely black on segment six.

Type.—Male; Porto Velho, Brazil, (Stanford Expedition; Mann and Baker), [M. C. Z., no. 16199]. *Allotype.*—♀, topotypical. *Paratypes.*—1 ♂ and 2 ♀, topotypical, [M. C. Z.].

Megachile arabilis new species (Pls. X, XI and XII)

Male.—Size: Length, 8.5 mm.; breadth of abdomen, 3 mm.; anterior wing, 6.5 mm.

Structure: Face longer than broad; eyes subparallel; mandibles 4-dentate, with a robust acute basal inferior projection, the lower margin not angulate medially; cheeks not quite equal to eyes in width, simple below; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum slightly longer than pedicel, the following joints about twice this length, the apical one not appreciably dilated; front coxae largely bare anteriorly, without red bristles, with flattened spines of moderate length; front femora strongly keeled beneath apically, the upper margin of the posterior face opposite this keel strongly carinate; front tarsi broadly dilated, the metatarsus deeply excavated anteriorly, somewhat produced apically but not attaining tip of second joint; mid tibia longer than the metatarsus, without an apical spur, but with a long slender apical spine and a low subapical protuberance; abdomen quite short and broad, the apical margins of the segments only slightly depressed medially, more deeply so laterally; dorsal surface of segment six vertical in position, the carina quite conspicuous, rounded on each side of the small median semicircular emargination, apical margin of the segment with carinate median teeth, the lateral ones acute, fairly conspicuous; segment seven inevident; four sternites exposed.

Puncturation: Fine and close but not crowded on vertex, mesonotum and pleura; shallow and close on cheeks; dense on face and clypeus; relatively sparse on the shining scutellum; minute and close on abdomen; segment six very finely rugosopunctate, and with scattered minute denticles.

Color: Black; antennae dark ferruginous; mandibles reddish apically; tegulae and legs pale ferruginous, the front tarsi more yellowish-ferruginous; abdominal sternites bronzy-ferruginous; wings dilute yellowish, the nervures ferruginous.

Pubescence: Entirely fulvous on vertex and dorsum of thorax; more ochraceous on face, pleura, propodeum, legs, and basal abdominal segments; whitish on cheeks below and on sternum; clypeus with dense pale pubescence, and with erect black hairs above; segments four and five of abdomen with dense ochraceous tomentum on basal half, with numerous erect black hairs on segment five, as also on segment four apically, and on disc of

segment three laterally; segments two to four with entire ochraceous apical fasciae, with slight evidences of a whitish fascia on segment five, segment six with only erect black hairs; front tarsal fringe quite long and dense, pale ochraceous without, brownish at tip and beneath; posterior fringe of mid tarsi very thin, silvery.

Type.—Male; Chapada, Brazil, (H. H. Smith), [A. N. S. P., no. 4145].

Megachile perita new species (Pls. X, XI and XII)

Male.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7.5 mm.

Structure: Facial quadrangle somewhat longer than broad; eyes very slightly converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with a short acute basal inferior projection; cheeks about as broad as eyes, neither bare nor tuberculate below; vertex flat, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum almost twice the length of the pedicel, the following joints three times the length of the pedicel, the apical one not dilated; front coxae bare anteriorly, without red bristles, the spines broad and flat, rounded apically; front femora strongly keeled apically, the posterior face carinate on the margin opposite the keel; front tarsi dilated, the metatarsi excavated anteriorly; mid tibia longer than the metatarsus, without an apical spur, but with a spine-like apical projection; abdomen short and rather broad, the apical margins of the segments slightly depressed; dorsal surface of segment six vertical in position, the carina prominent, with a slight median emargination, regularly rounded on each side, apical margin of the segment with scarcely discernible median teeth, the lateral teeth minute and acute; segment seven barely visible, obtuse; four sternites exposed.

Puncturation: Fine and dense throughout; more distinct on vertex medially, on scutellum, and on pleura below; shallow and indistinct on cheeks; densely crowded on mesonotum, vertex laterally, and on entire abdomen; segment six also with very minute scattered denticles; punctures on legs relatively sparse.

Color: Black in general; antennae dull ferruginous; front femora largely ferruginous, the keel yellowish, the upper half of the posterior face above the keel blackish; front tibiae ferruginous, but the outer face more or less blackened; front tarsi reddish-yellow; mid and hind legs piceous, suffused with red; tegulae yellowish-ferruginous; wings subhyaline or slightly yellowish, the nervures ferruginous; front and hind spurs pale yellow.

Pubescence: White on face, with a black fringe on upper margin of clypeus, and scattered black hairs at sides of face, dense and white on cheeks below; fulvous on vertex and thorax above, more whitish on thorax laterally and posteriorly; whitish on legs; long and ochraceous on segments one and two of abdomen, segment three with a dense black band on disc, and a slight amount of black at sides of segments two and four, segment four and base of segment five covered with dense ochraceous tomentum, the latter with long erect black hairs; segments one to four with entire ochraceous apical fasciae, segment five being not fasciate, and segment six without pale tomentum but with scattered erect dark hairs; front tarsal fringe ochraceous basally, white apically, but tipped with brownish; mid metatarsus with a long thin ochraceous posterior fringe; hind metatarsi fringed with blackish or deep reddish hairs on both margins.

Type.—Male; Chapada, Brazil, May, (H. H. Smith), [A. N. S. P., no. 4147].

Megachile gomphrenae Holmberg

1886. *Megachile gomphrenae* Holmberg, Act. Acad. Nac. Cien. Cordoba, v, p. 140.
1908. *Megachile gomphrenae* var. *saltensis* Friese, Apid. v. Argentina, (Silkeborg), p. 65.
1909. *Megachile gomphrenae* Joergensen, D. Ent. Zeitschr., 1909, p. 213.
1909. *Megachile gomphrenae* var. Schrottky, Anal. Soc. Cien. Argentina, LXVIII, p. 268.
1913. *Megachile gomphrenae* Schrottky, Rev. Mus. Paulista, IX, p. 178.

Carcarana, Argentina, [A. N. S. P., 1 ♂; det. Cockerell].

Megachile manaosensis new species (Pls. X, XI and XII)

Male.—Size: Length, 9 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 6 mm.

Structure: Facial quadrangle slightly longer than broad; eyes slightly converging below; apical margin of clypeus with a rounded median emargination; mandibles 4-dentate, with an acute basal inferior projection, slightly angulate medially on the inferior margin; cheeks about as broad as eyes, the inferior angle with a triangular carinate protuberance; vertex very slightly rounded, the hind margin very slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum somewhat longer than the pedicel, the following joints about twice as long as broad, the apical one slightly dilated and flattened; front coxae bare anteriorly, without red bristles, the spines somewhat flattened but rather narrow, about three times as long as broad; front femora slightly keeled apically, but not

carinate on upper margin of posterior face; front tarsi only slightly dilated, the metatarsi long, narrow and parallel-sided, rather deeply excavated anteriorly; mid tibia longer than the metatarsus, without an apical spur, with a robust subapical triangular projection; abdomen narrow and parallel-sided, apical margins of the segments narrowly but deeply depressed; dorsal surface of segment six vertical in position, the carina rather low, roundly emarginate medially, apical margin of the segment with low but evident median carinate teeth, the lateral teeth vestigial; segment-seven obtuse; four sternites exposed.

Puncturation: Uniformly fine and dense throughout, especially minute and densely crowded on mesonotum, relatively sparse and indistinct on the legs.

Color: Black in general; antennae blackish; legs beyond the trochanters ferruginous, the tarsi yellowish but the mid and hind tarsi suffused with red; tegulae yellowish-ferruginous; wings slightly infuscated, slightly violaceous, the nervures deep ferruginous to fuscous; spurs pale yellow.

Pubescence: Pale ochraceous on face, vertex, thorax above, and basal abdominal segments, dense on face without black admixture, thin on vertex, mesonotum and scutellum, but mesonotum with dense ochraceous tomentum anteriorly, with a similar dense patch behind each tegula, and a fascia in the scutello-mesothoracic suture; pubescence white on cheeks, thorax below, and legs; discs of segments three and four with very short blackish pubescence, as also segment two laterally; segments one to three with entire narrow ochraceous apical fasciae, and segment four with a similar basal fascia, being also fasciate apically, but this broadly interrupted medially; basal half of segment five covered with dense ochraceous tomentum, pubescence otherwise short, erect, thin and pale; segment six entirely covered with very dense pale ochraceous tomentum, with a few erect pale hairs; second and third sternites white fasciate apically; front tarsal fringes rather short and dense, white, slightly brownish beneath; mid tarsus with a long thin white posterior fringe.

Type.—Male; Flores, Manaos, Amazonas, Brazil, August 2, 1924, [Meyer].

Megachile infinita new species (Pl. XII)

Male.—Size: Length, 10 mm.; breadth of abdomen, 3 mm.; anterior wing, 7.5 mm.

Structure: Facial quadrangle longer than broad; eyes slightly converging below; apical margin of clypeus slightly emarginate medially; mandibles 3-dentate, without an inferior projection; cheeks nearly as broad as eyes, not protuberant below; vertex

slightly rounded, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum about equal to pedicel in length, the following joints twice this length, the apical one not dilated; front coxae thinly pubescent anteriorly, the spines flattened, about twice as long as the width at base; front femora not keeled; front tarsi dilated, the second joint about as long as the metatarsus, which is not excavated anteriorly; mid tibia longer than the metatarsus, with the usual apical spur; abdomen rather short and broad, apical margins of the segments depressed; dorsal surface of segment six vertical in position, slightly protuberant medially toward base, the carina low, broadly incurved medially, apical margin of the segment without evident teeth; segment seven barely visible; four sternites exposed.

Puncturation: Close and rather fine in general; crowded on cheeks, clypeus, mesonotum and pleura, more distinctly separated on vertex and scutellum; very fine on abdomen, crowded on basal segments, more distinctly separated on apical segments, densely crowded on segment six; minute and rather close on tegulae, variable on legs.

Color: Black in general; antennae ferruginous beneath, more brownish above; mandibles suffused with red; legs entirely ferruginous, the front tarsi more yellowish; tegulae yellowish-ferruginous; wings slightly infuscated, violaceous apically, the nervures ferruginous; spurs pale ferruginous.

Pubescence: Entirely pale on head and thorax, and on abdomen except discs of segments three and four, which are black pubescent; white on cheeks, sternum, legs and venter of abdomen, dense on cheeks below; cream color on face, dense except on upper half of clypeus; ochraceous on vertex, thorax laterally and posteriorly, and on most of abdomen; more fulvous on thorax dorsally; segments one to five with entire, pale ochraceous, apical fasciae; segment six largely covered with thin, subappressed silvery pubescence; front tarsal fringes reddish-ochraceous, and mid metatarsi with similar but thinner fringes.

Type.—Male; Chapada, Brazil, October, (H. H. Smith), [A. N. S. P., no. 4134].

Megachile bernardina Schrottky

1913. *Megachile bernardina* Schrottky, Rev. Mus. Paulista, IX, p. 209.

Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P., 1 ♂].

The front tarsi are somewhat similar to *candida* (Pl. XI), but the anterior margins of the metatarsus are more concave.

Megachile candida Smith (Pls. X, XI and XIII)

1879. *Megachile candida* Smith, Descr. N. Sp. Hym. Brit. Mus., p. 82.
1896. *Megachile candida* Cockerell, Ann. Mag. Nat. Hist., (6), XVIII, p. 286.
1911. *Megachile candida* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 257.

Kartabo, British Guiana, July–August, 1920, (Wheeler), [M. C. Z., 1 ♂, 5 ♀]. Cerro Patron, 4000 ft., Rio Frio and Sevilla, Magdalena, Colombia, September, November and December, (Salt, 1 ♂, 2 ♀). Chichen Itza, Yukatan, [Titus, 1 ♀]. Prieta, British Honduras, [Meyer, 4 ♀]. Guadalajara, Mexico, [A. N. S. P., 2 ♀]. Mexico, [A. N. S. P., 8 ♀]. Trinidad Island, June, July and October, 1902, (Chapman), [Titus, 8 ♂, 2 ♀].

Megachile candidella new species (Pl. XIII)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 7 mm.

Structure: Facial quadrangle nearly square; eyes subparallel; apical margin of clypeus with a small emargination on each side of a median tubercle; mandibles 4-dentate, the two median teeth approximate, deeply emarginate between the third and fourth where there is also a straight cutting edge; cheeks below as broad as eyes, narrowed above; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum twice the length of the pedicel, the second one slightly shorter; mid and hind metatarsi but slightly shorter and narrower than their respective tibiae, the joints of the mid tarsi with a quite regular apical fringe of strong reddish bristles beneath; claws with sharp basal teeth; abdomen cordate, the apical margins of the segments only slightly depressed; segment six straight laterally in dorsal aspect, and straight in profile with no erect hairs visible, the ventral plate largely bare, with a bare apical lip.

Puncturation: Coarse, deep and well separated on clypeus and supraclypeal area; much finer and closer on vertex and cheeks; very fine and densely crowded on mesonotum and scutellum, but not so densely crowded on pleura where they are coarser below; fine and close on abdomen throughout.

Color: Black; antennae obscurely brownish-ferruginous beneath; mandibles obscurely reddish; tegulae piceous medially, more yellowish marginally; wings subhyaline, slightly infuscated in region of radial cell, the nervures ferruginous; spurs yellowish.

Pubescence: Pale ochraceous on head, thorax and basal abdominal segments, with no black intermixture, dense at sides of face, the mesonotum with some whitish appressed tomentum

anteriorly, and a similar fascia in the scutello-mesothoracic suture; discs of segments three to five with short inconspicuous fuscous pubescence, paling to yellow apically, segments one to five with entire dense ochraceous apical fasciae, these narrowed medially on the more basal segments; segment six entirely covered with dense ochraceous tomentum, with longer erect golden hairs laterally; scopa entirely ochraceous.

Type.—Female; Mexico, [A. N. S. P., no. 4149].

This is closely related to *M. candida* Smith, but the latter may be easily distinguished by the greyish tomentum and erect black hairs of segment six. Recognition of the male of this new form is necessary before we can be certain that it is distinct from *candida*, and a series of females is also desirable.

Megachile villarricensis new species (Pl. XIII)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 7.5 mm.

Structure: Facial quadrangle about as broad as long; eyes subparallel; apical margin of clypeus slightly emarginate on each side of a median denticle; mandibles 4-dentate, the two median teeth approximate, deeply emarginate between the third and fourth where there is a straight cutting edge; cheeks about as broad as eyes, at least below, slightly narrowed above; vertex flat, hind margin very slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum not quite twice the length of the pedicel, slightly longer than the second joint, the apical one considerably longer; mid and hind metatarsi only slightly shorter and narrower than the respective tibiae, the joints of the mid tarsi fringed beneath apically with an even row of strong red bristles; claws with strong basal teeth; abdomen cordate, the hind margins of the segments somewhat depressed; segment six very slightly concave laterally in dorsal aspect, straight in profile, with only suberect hairs toward the base visible in profile, the ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Rather close and fine on vertex medially, and on cheeks, more definitely separated on vertex laterally; coarse and distinct on clypeus, with shining intervening spaces, more sparse on the supraclypeal area; densely crowded on thorax, finely so above, more coarsely so on pleura; very fine and close on abdomen throughout.

Color: Black; antennae obscurely brownish-fuscous beneath; tegulae reddish-piceous; wings very slightly infuscated, the nervures fuscous; spurs yellowish; hind metatarsi suffused with red basally.

Pubescence: Whitish and rather short and thin on head and thorax, with longer dark hairs on clypeus, vertex, between antennae, on scutellum, and scattered shorter ones on mesonotum; a slight amount of white tomentum in scutello-mesothoracic suture and on lower margin of scutellum; legs and basal segment of abdomen white pubescent; discs of segments two to five with short erect black pubescence, segments one to five with entire whitish apical fasciae, thin on the basal segments, broad and dense on the apical ones; segment six rather densely covered with brownish-grey appressed pubescence, with erect black hairs which are longer laterally; scopa pale ochraceous, blackish at extreme sides of segments three to six.

Type.—Female; Villarrica, Paraguay, February, 1923, [Meyer].

Paratypes.—5 ♀, topotypical, November and February, [Meyer].

This also is closely allied to *M. candida* Smith.

Megachile civilis new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 3 mm.; anterior wing, 6 mm.

Structure: Facial quadrangle slightly broader than long; eyes subparallel; apical margin of clypeus with a rather strong median denticle and two weaker lateral denticles; mandibles 4-dentate, the two median teeth approximate, the third quite broadly truncate, a cutting edge between the third and fourth; cheeks below about as broad as eyes, somewhat narrower above; vertex almost flat, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum almost twice the length of the pedicel, the second joint but slightly longer than the pedicel, the apical one much the longest; mid and hind metatarsi slightly shorter and narrower than the respective tibiae, the joints of the mid tarsi fringed beneath at apex with red bristles; claws with basal teeth; abdomen cordate, the apical margins of the segments slightly depressed laterally; segment six slightly concave laterally in dorsal aspect, straight in profile, with numerous rather short erect hairs visible in profile, the ventral plate largely bare, with a bare apical lip.

Puncturation: Fine and close on vertex and face, somewhat more sparse between ocelli; shallow and close on cheeks; coarser and deeper on clypeus, close laterally, distinctly separated medially; densely crowded on thorax, finely so above, more coarsely so on pleura; very fine and close on abdomen throughout.

Color: Black; antennae obscurely reddish-brown below; mandibles and hind legs slightly suffused with red; tegulae dark bronzy-red; wings slightly infuscated, the nervures piceous; spurs yellowish.

Pubescence: Mostly whitish, short and thin on head, thorax and basal segments of abdomen, with short black hairs on vertex, mesonotum, scutellum, and between antennae; very short and black on discs of segments two to five of abdomen; dense, appressed, pale ochraceous tomentum on mesonotum anteriorly, in scutello-mesothoracic suture, on hind margin of scutellum, and a dense patch behind each tegula at lateral angles of mesonotum; segments one to five with entire, pale ochraceous, apical fasciae, narrow medially on the basal segments; segment six with fine appressed whitish pubescence and short erect black hairs; scopa entirely pale ochraceous.

Type.—Female; Villarrica, Paraguay, February 1923, [Meyer]. *Paratype.*—1 ♀, topotypical, January, [Meyer].

Megachile asuncicola Strand

1910. *Megachile asuncicola* Strand, Zool. Jahrb., Abth. Syst., XIX, p. 530.

Asuncion, Paraguay, January 16, 1916, [Mitchell, 1 ♀; det. Strand].

The mandibles in this species are of the *fossoris-furcata* type (Pl. XIII).

Megachile morosa new species (Pl. XIII)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 7 mm.

Structure: Face about as broad as long; eyes subparallel; apical margin of clypeus with a shallow median emargination and a strong denticle in the center of this, very slightly crenulate on each side; mandibles 4-dentate, the two middle teeth approximate, a cutting edge between the third and fourth; cheeks below as broad as eyes, somewhat narrower above; vertex flat, the hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum nearly twice the length of the pedicel, the second joint and the pedicel subequal; mid and hind metatarsi only slightly shorter and narrower than the respective tibiae; claws with small seta-like basal teeth; abdomen cordate, the hind margins of the segments slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile very slightly concave apically, with only suberect hairs visible, the ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Fine and rather indistinct on cheeks; coarser, deeper and quite sparse on vertex and on the shining clypeus and supraclypeal area; fine and quite close, but not crowded on mesonotum and scutellum; very close and fine on pleura above, more coarse below; very fine and close on abdomen throughout.

Color: Black, including the legs; antennae somewhat more piceous below; tegulae somewhat piceous; wings lightly infuscated, slightly darker apically, the nervures piceous; spurs yellowish.

Pubescence: Creamy-white on sides of face, on cheeks, pleura, propodeum, basal segment of abdomen, and on legs in large part; fuscous on vertex and clypeus, with intermixed whitish and long black hairs between antennae; fuscous, more or less intermixed with short pale hairs on mesonotum and scutellum; a few black hairs beneath each tegula; short and black on discs of segments two to five of abdomen, and these with entire ochraceous apical fasciae; the scutello-mesothoracic suture subfasciate; segment six with appressed ochraceous or cinereous tomentum and longer erect black hairs which are more evident laterally; scopa yellowish-white, with a few black hairs at extreme sides of all except segment two.

Type.—Female; Buenavista, Bolivia, [Meyer].

Megachile ater new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 8.5 mm.

Structure: Facial quadrangle slightly broader than long; eyes subparallel; apical margin of clypeus incurved medially, with a very minute median tubercle; mandibles 4-dentate, the teeth very low and inconspicuous (probably worn), the two apical ones approximate; cheeks about equal to eyes in width, but little narrowed above, the hind margin subcarinate; vertex nearly flat, hind margin incurved; lateral ocelli nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to the pedicel, longer than the second joint; mid and hind metatarsi almost as wide and but slightly shorter than the respective tibiae; claws with acute basal teeth; abdomen more ovoid than cordate, the hind margins of the segments depressed laterally, but not medially; segment six very slightly concave laterally in dorsal aspect, in profile straight, with numerous erect hairs visible, the ventral plate largely bare and shining, with a bare apical lip.

Puncturation: Fine, close and shallow on cheeks and face; deeper and distinctly separated on shining vertex; rather close laterally on clypeus and supraclypeal area, but sparse medially, with an impunctate median line; very fine and close on mesonotum and scutellum; fine on pleura above, but somewhat coarser and more widely separated below where the surface is shining; fine and close on abdomen throughout.

Color: Black; antennae ferruginous below; tegulae shining reddish-fuscous; wings pale yellow, the nervures yellowish-ferruginous; spurs yellowish.

Pubescence: Quite uniformly fuscous throughout, except for a slight amount of pale pubescence on sternum; abdominal segments with entire fuscous apical fasciae, inconspicuous because of their color; scopa entirely white on segments two and three, entirely black on segments four to six, the ventral segments with traces of very thin white apical fasciae beneath the scopa.

Type.—Female; Buenavista, Bolivia, [Meyer].

Megachile sterilis new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus with a slight median emargination; mandibles 4-dentate, the teeth acute and rather close, cutting edges between the second, third and fourth; cheeks below about as broad as eyes, slightly narrowed above; vertex nearly flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than the pedicel, the second joint subequal to the pedicel; mid and hind metatarsi slightly shorter and narrower than the respective tibiae; claws with sharp basal teeth; posterior faces of mid and hind femora with rather pronounced concavities; abdomen cordate, the hind margins of the segments rather strongly depressed laterally; segment six nearly straight laterally in dorsal aspect, in profile very slightly concave apically with no erect hairs visible, ventral plate largely bare, with a distinct bare apical lip.

Punctuation: Close on cheeks and vertex, fine on the latter, coarser but shallow on cheeks; more coarse, deep and sparse on clypeus and supraclypeal area medially, closer laterally; fine and rather close but distinctly separated on mesonotum and scutellum medially, closer laterally; fine and close on pleura above, somewhat more coarse below; fine and close on abdomen, indistinct on the basal segments, very fine and close on segment six.

Color: Black; antennae brownish beneath; tegulae piceous; wings lightly infuscated, more deeply so in region of radial cell, nervures ferruginous; spurs yellowish.

Pubescence: Whitish on face laterally and between antennae, on cheeks, pleura, propodeum, basal segment of abdomen, and legs in large part; fuscous, with intermixed shorter whitish hairs on clypeus, vertex, mesonotum and scutellum; short and black on discs of segments two to five of abdomen; brownish in part on front and middle tarsi and tibiae; segments two to five with entire narrow ochraceous apical fasciae; segment six with brown-

ish appressed tomentum, with erect black hairs visible at sides toward base; scopa pale yellowish, black in part on segments five and six, and with a few lateral black hairs on segment four.

Type.—Female; Cordova, Argentine, (Davis), [M. C. Z., no. 16211]. *Paratype.*—1 ♀, topotypical, [M. C. Z.].

Megachile ampla new species

Female.—Size: Length, 15 mm.; breadth of abdomen, 5.5 mm.; anterior wing, 11 mm.

Structure: Face very slightly broader above than long; eyes subparallel; apical margin of clypeus straight, but with a slight median indentation; mandibles 4-dentate, the two apical teeth approximate, cutting edges between the second, third and fourth (as in *benigna*, Pl. XIII); cheeks below considerably wider than eyes, slightly narrowed above, the hind margin above slightly carinate; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum somewhat longer than the pedicel, the second joint nearly equal to the basal one; mid and hind metatarsi but slightly shorter and narrower than the respective tibiae; claws with seta-like basal teeth; abdomen more ovoid, the hind margins of the segments depressed laterally but not medially; segment six nearly straight laterally in dorsal aspect, in profile straight with numerous rather short erect hairs visible, the ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Rather fine and indistinct on cheeks, sparse below; close, fine and shallow on vertex, being minute and irregularly distributed between eyes and ocelli; fine and sparse on clypeus and supraclypeal area medially, more coarse and deep laterally; rather fine and distinctly separated on shining mesonotum, the scutellum almost impunctate on upper face, but with scattered punctures posteriorly and laterally; rather fine and close on pleura above, somewhat coarser and distinctly separated below; minute and rather close on abdomen, very fine and close on segment six, indistinct on basal segments.

Color: Black; antennae ferruginous beneath; tegulae bright yellowish-ferruginous; wings yellowish, the nervures yellowish-ferruginous; legs dark, the spurs yellowish.

Pubescence: Creamy-white on cheeks, pleura, propodeum, on anterior middle of mesonotum, and legs in large part; whitish intermixed with fuscous hairs on face laterally and between antennae, on mesonotum posteriorly, on scutellum, and basal segment of abdomen; reddish-fuscous on clypeus; fulvous on vertex and on antero-lateral portions of mesonotum and on prothoracic tubercles; very short and whitish on basal portions

of discs of abdominal segments, but these with longer black hairs apically, this conspicuous on each segment laterally; segment six with whitish tomentum and erect whitish hairs, without any black intermixture; scopa white medially and basally, black laterally on segments three to five.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratypes.*—2 ♀, topotypical, [Meyer].

Megachile trepida new species

Female.—Size: Length, 10.5 mm.; breadth of abdomen, 3.3 mm.; anterior wing, 7.5 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus subemarginate medially, otherwise entire; mandibles 4-dentate, cutting edges between the second, third and fourth (as in *benigna*, Pl. XIII); cheeks below broader than eyes, somewhat narrowed above; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum very slightly longer than the pedicel or the second joint, the latter two being subequal; mid and hind metatarsi distinctly shorter and slightly narrower than the respective tibiae; claws with minute, seta-like basal teeth; abdomen cordate, hind margins of the segments depressed laterally but not medially; segment six straight laterally in dorsal aspect, in profile straight with no evident erect hairs visible, ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Shallow and somewhat scattered on cheeks; fine and quite close on vertex; more coarse and deep on shining clypeus and supraclypeal area, sparse medially; rather fine and close but distinct on mesonotum and scutellum; fine and crowded on pleura above, coarser and more distinct below; minute and close on abdomen, indistinct on basal segments, very minute and densely crowded on segment six.

Color: Black; antennae ferruginous below; wings yellowish, the nervures and tegulae yellowish-ferruginous; legs black; spurs yellowish.

Pubescence: Whitish on cheeks above and on pleura below; whitish intermixed with fuscous hairs on face laterally and between antennae, and on cheeks below; fuscous, with shorter intermixed paler hairs on clypeus and vertex; mostly fuscous on mesonotum, and at least in part on scutellum, but fulvous on mesonotum laterally and scutellum posteriorly; more ochraceous on propodeum, basal segment of abdomen and on upper pleura where there is a patch of fuscous hairs just below tegulae; short and fuscous on legs in large part, tending to whitish basally, brownish-fuscous on outer face on mid metatarsus; short and

black on discs of segments two to five of abdomen, segments three to five with inconspicuous ochraceous apical fasciae which are interrupted medially; segment six with greyish tomentum, with a few erect black hairs laterally near the base; scopa white on segment two and on the following segments medially, all of these black laterally.

Type.—Female; Cerro Patron, Rio Frio, Magdalena, Colombia, 4000 ft., November 12, 1927, (Salt), [Salt]. *Paratypes.*—1 ♀, topotypical; 2 ♀, Vista Nieve, Santa Marta, Colombia, 5000 ft., February 25, 1923, (M. A. Carriker) [Salt]; February 10, 1927, on Begonia, (Salt), [Salt].

Megachile benigna new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle with length and breadth subequal; eyes subparallel; apical margin of clypeus subemarginate medially, otherwise straight and entire; mandibles 4-dentate, the teeth acute, with cutting edges between the second, third and fourth teeth; cheeks below as wide as eyes, somewhat narrowed above; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum longer than the pedicel and also longer than the second joint; mid and hind metatarsi slightly shorter and narrower than their tibiae; claws with seta-like basal teeth; abdomen cordate, hind margins of the segments considerably depressed laterally but not medially; segment six straight laterally in dorsal aspect and in profile, with no evident erect hairs except at extreme sides basally, the ventral plate largely bare, with a definite bare apical lip.

Puncturation: Close and fine on cheeks, face, vertex, mesonotum, scutellum, and pleura above; more sparse on clypeus and supraclypeal area, especially medially; more definitely separated on pleura below; minute and dense on abdomen throughout.

Color: Black; antennae below and tegulae ferruginous; wings very faintly yellowish, subhyaline, the nervures ferruginous; legs more or less suffused with red; spurs yellowish.

Pubescence: Very dense and reddish-ochraceous on vertex and dorsum of thorax; paler ochraceous on cheeks, pleura, propodeum, legs, and basal segments of abdomen; mixed ochraceous and blackish on face, more blackish on clypeus; fuscous on outer faces of front and middle metatarsi; short and ochraceous on segments three to five of abdomen, segments two to five with entire ochraceous apical fasciae; segment six with very fine ochraceous tomentum and a few basal erect yellowish hairs

toward the sides; scopa pale ochraceous on segments two to four, mostly blackish on segments five and six, as also on segment four laterally.

Type.—Female; Chapada, Brazil, May, (H. H. Smith), [A. N. S. P., no. 4138]. *Paratypes.*—19 ♀, topotypical, November–April, [A. N. S. P.].

Megachile viator new species

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Face broader above than long; eyes slightly converging below; apical margin of clypeus subemarginate medially, otherwise entire; mandibles 4-dentate, cutting edges between the second, third and fourth teeth; cheeks below broader than eyes, slightly narrowed above; vertex nearly flat, hind margin incurved; lateral ocelli very slightly nearer edge of vertex than to eyes; basal joint of flagellum nearly twice the length of the pedicel, slightly longer than the second joint; mid and hind metatarsi but slightly shorter and narrower than the respective tibiae; claws with sharp basal teeth; abdomen cordate, hind margins of the segments considerably depressed except medially; segment six very slightly concave laterally in dorsal aspect, in profile straight with no evident erect hairs, the ventral plate largely bare, with a definite bare apical lip.

Puncturation: Shallow on cheeks, rather sparse and coarse below, finer and closer above; quite fine and close but not crowded on vertex; rather sparse medially on the shining clypeus and supraclypeal area, more close laterally; rather uniformly close but hardly crowded on mesonotum and scutellum; fine and close on pleura above, more coarse and sparse below; very fine and quite close on abdomen throughout, minute and densely crowded on segment six.

Color: Black; antennae beneath, tegulae, wing nervures and spurs bright ferruginous; wings dilute yellowish; legs black except for the reddened tips of all the tibiae and the ferruginous apical tarsal joints.

Pubescence: Whitish on cheeks, pleura, propodeum, and legs in large part; long and more yellowish-white on vertex, mesonotum medially, scutellum, and basal segment of abdomen; more fulvous around the tegulae; whitish intermixed with scattered darker hairs on face; rather short and pale ochraceous on discs of abdominal segments two to five, these with entire conspicuous pale ochraceous fasciae, and segment one with a similar narrower fascia; segment six with appressed silvery tomentum and a few

erect silvery hairs laterally; scopa white, black on segment four except in center and entirely black on segment five, more ferruginous on segment six.

Type.—Female; San Jose, Costa Rica, June 25, 1903, (J. C. Crawford), [U. S. N. M., no. 43096]. *Paratype.*—1 ♀, topotypical, on *Dahlia*, [Titus].

Megachile felicis new species

Female.—Size: Length, 11 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 9.5 mm.

Structure: Facial quadrangle with length and breadth subequal; eyes subparallel; apical margin of clypeus subemarginate medially, otherwise entire and straight; mandibles 4-dentate, all the teeth acute, the three apical ones approximate, with cutting edges between the second, third and fourth (somewhat similar to *santaremensis*, Pl. XIII); cheeks subequal to eyes in width, but slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum almost twice the length of the pedicel, subequal to the second joint; mid and hind metatarsi but very slightly shorter than the respective tibiae, and but slightly narrower; claws with basal setae, but without distinct teeth; abdomen broadly cordate, hind margins of the segments slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with erect hairs visible basally, the ventral plate largely bare, with a bare apical lip.

Puncturation: Very fine and close on cheeks, face and vertex; more sparse on clypeus and supraclypeal area, which have a rather indefinite median impunctate line; apparently very close and fine on mesonotum and scutellum, but hidden by the dense pubescence; somewhat coarser and distinct on pleura; fine on abdomen, close on basal segments but becoming somewhat scattered toward segment five; segment six very closely and finely punctate.

Color: Black; antennae obscurely ferruginous beneath; tegulae dark reddish; wings quite uniformly fuliginous, slightly darker in radial cell, the nervures ferruginous to piceous; spurs yellowish-ferruginous.

Pubescence: Whitish at sides of face and between antennae, on cheeks, pleura, and legs in large part, intermixed slightly with black at sides of face; more creamy-white or pale ochraceous and extremely dense on entire dorsum of thorax and basal segment of abdomen; black on clypeus, vertex, and segments two to six of abdomen, the latter not at all fasciate; fuscous or brownish on outer faces of front and middle tibiae and metatarsi, as also on

hind tibiae posteriorly; scopa white, black on segment six and at extreme sides of all the others, segment five with black hairs extending nearly across the apical margin.

Type.—Female; Tapyta, Paraguay, November 1925, [Meyer].

Megachile delectus new species (Pl. XIV)

Female.—Size: Length, 11.5 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 9 mm.

Structure: Facial quadrangle with length and breadth subequal; eyes subparallel; apical margin of clypeus shining and impunctate on median third, with a slight indication of a median denticle, otherwise entire; mandibles 4-dentate, the teeth acute, with cutting edges between the second, third and fourth; cheeks subequal to eyes in width, slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli very slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than the pedicel, subequal in length to second joint; mid and hind metatarsi slightly shorter and narrower than the respective tibiae; claws with small acute basal teeth; abdomen cordate, hind margins of the segments considerably depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with no erect hairs visible, the ventral plate largely bare and shining, with a bare apical lip.

Puncturation: Fine and close on cheeks, face, vertex and mesonotum; somewhat coarser on clypeus and supraclypeal area, close except for an impunctate median line; relatively fine and sparse on the shining scutellum; fine and densely crowded on pleura above, relatively coarse and distinctly separated below; uniformly minute and very close on abdomen throughout.

Color: Black; antennae, mandibles, legs, tegulae, and ventral and lateral portions of basal abdominal segment bright ferruginous; wings subhyaline, faintly yellowish apically and in radial cell, the nervures pale ferruginous; spurs pale ferruginous.

Pubescence: Dense and ochraceous on dorsum and sides of thorax, paling to whitish on sternum; more fulvous on vertex and outer faces of front and middle metatarsi; ochraceous on cheeks, legs, propodeum and basal segments of abdomen; mixed black and white on face and clypeus below level of antennae; fulvo-ochraceous between antennae and ocelli; segment three of abdomen with black pubescence, segments four and five with dense yellow tomentum, with a few erect black hairs at extreme sides; segments one to five with broad dense entire yellow apical fasciae; segment six with mostly black subappressed pubescence, with erect black hairs at sides and with a minute inconspicuous pale pilosity; scopa white, entirely black on segments five and six, and black laterally on segments three and four.

Type.—Female; Chapada, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4148].

Megachile obliqua new species

Female.—Size: Length, 11 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 9 mm.

Structure: Facial quadrangle with length and breadth subequal; eyes parallel; apical margin of clypeus straight and entire, somewhat thickened and shining medially; mandibles 4-dentate, the two apical teeth approximate, a slight angle between the third and fourth, a cutting edge between the second and third; cheeks below as broad as eyes, narrower above, hind margins subcarinate; vertex flat, hind margin very slightly incurved; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum considerably longer than pedicel, slightly longer than the second joint; mid and hind metatarsi fully as broad and very nearly as long as the respective tibiae; claws with minute seta-like basal teeth; abdomen broadly cordate, hind margins of the segments slightly depressed laterally but not medially; segment six slightly concave laterally in dorsal aspect, in profile straight with erect basal hairs visible, the ventral plate largely bare and shining, with a bare apical lip.

Puncturation: Very fine and densely crowded on face and vertex, becoming more coarse and quite sparse on the shining cheeks below and on supraclypeal area, very sparse and fine on the shining clypeus; fine and close but not crowded on mesonotum; minute and somewhat scattered on scutellum; fine and close on pleura above, sparse below where the surface is shining; fine and rather close on abdomen apically, very minute and indistinct on basal segments, very fine and close on segment six.

Color: Black; antennae ferruginous beneath; tegulae yellowish-ferruginous; wings yellowish, the nervures ferruginous; apical joints of tarsi and basal segments of abdomen ferruginous, as also the more apical ventral plates; spurs yellowish.

Pubescence: Creamy white on cheeks below, and on sternum and legs in large part; more ochraceous on cheeks above, pleura, propodeum, and basal abdominal segment; deeper ochraceous on vertex, mesonotum and scutellum; ochraceous with intermixed black hairs on face below level of antennae; short and dark on discs of segments three to five, as also on segment two laterally; segment six with fine pale ochraceous pilosity and scattered dark erect hairs toward base; scopa whitish on segments two and three, more ochraceous on segment three laterally, mostly blackish on segments four to six, the ventral plates with white apical fasciae which are well defined at least laterally.

Type.—Female; British Guiana, April 16, 1901, (Crew), [U. S. N. M., no. 43095].

Megachile davisi new species (Pl. XIII)

Female.—Size: Length, 12 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Face broader than long; eyes but slightly converging below; apical margin of clypeus polished and impunctate, with a minute median denticle; mandibles 4-dentate, cutting edges between the second, third and fourth teeth; cheeks below broader than eyes, somewhat narrowed above; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum about twice the length of the pedicel, the second joint but slightly longer than the pedicel; mid and hind metatarsi shorter and slightly narrower than the respective tibiae; claws with sharp basal teeth; abdomen cordate, hind margins of the segments strongly depressed laterally, but not at all medially; segment six concave laterally in dorsal aspect, in profile straight with only suberect hairs visible, the ventral plate largely bare, with a bare apical lip.

Puncturation: Close and rather fine on cheeks; sparse on vertex laterally, closer medially, but with a median impunctate line; sparse in center of shining supraclypeal area, closer on clypeus, but rather sparse medially; fine and rather close on mesonotum, but distinctly separated medially, as also on scutellum; close on pleura, fine above, more coarse below; fine and rather sparse on the shining abdomen, very fine and close on segment six.

Color: Black; antennae pale brownish beneath; mandibles reddened apically; tegulae ferruginous, more or less suffused with fuscous; wings faintly infuscated, more deeply so on costal half of radial cell, nervures fuscous; spurs yellowish; abdomen with faint violet reflections.

Pubescence: White on face laterally and between antennae, and on cheeks, pleura above, propodeum, basal segment of abdomen, and legs in part; black on clypeus, vertex, pleura below, sternum, and discs of segments two to five of abdomen; mesonotum and scutellum with intermixed black and white pubescence; brownish-fuscous on front and middle tarsi, and on these tibiae in part, and a slight amount on the hind tarsi; segments one to five with entire conspicuous white apical fasciae; segment six with appressed whitish tomentum and longer black hairs which are erect laterally but only suberect medially; scopa pale yellowish, with a few lateral black hairs on segment six.

Type.—Female; Cordoba, Argentina, (W. M. Davis), [M. C. Z., no. 16210].

Megachile banksi new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7.5 mm.

Structure: Face about as broad as long; eyes converging below; apical margin of clypeus with a very minute median denticle, with slight irregularities on each side of this, otherwise entire; mandibles 4-dentate, the two apical teeth approximate, cutting edges between the second, third and fourth; cheeks below as broad as eyes, somewhat narrowed above; vertex nearly flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum longer than the pedicel, the second joint about equal to the pedicel; mid and hind metatarsi shorter and narrower than the respective tibiae; claws with sharp basal teeth; abdomen cordate, the apical margins of the segments slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with abundant erect hair visible, the ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Close and fine on cheeks; relatively sparse on vertex; quite deep and rather coarse on clypeus and supraclypeal area, close except in center of each; fine and rather close, but distinct on mesonotum and scutellum; close on pleura, fine above, more coarse below; fine on the shining abdomen, sparse medially, more close laterally and on apical segments, very fine and close on segment six.

Color: Black; antennae obscurely brownish-ferruginous beneath; tegulae fuscous to blackish; wings somewhat infuscated, more deeply so apically, the nervures piceous; spurs pale yellow.

Pubescence: White on face laterally, on cheeks, pleura, propodeum, legs in large part, and on basal segment of abdomen, with dense white tufts behind tubercles and behind wing bases; black on clypeus, vertex, mesonotum, scutellum, and slight amounts of short black pubescence on apical abdominal segments, with a black patch on upper pleura beneath tegulae; intermixed black and white between antennae; scutello-mesothoracic suture inconspicuously white fasciate, and abdominal segments with cream-colored apical fasciae evident laterally; segment six with whitish appressed tomentum and erect black hairs, and segment five with rather numerous erect black hairs apically; scopa pale yellowish, with a few dark hairs on segment six laterally.

Type.—Female; Canal Zone, Ancon, Panama, August 4, 1924, (N. Banks), [M. C. Z., no. 16202]. *Paratypes.*—3 ♀; Rio Frio, Magdalena, Colombia, April 25, 1927, on *Antigonon leptopus* and *Trilobus cistoides* (Salt), [Salt]. 1 ♀; Chichen Itza, Yukatan, [Titus].

Megachile indigoferae new species

Female.—Size: Length, 9 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 6 mm.

Structure: Facial quadrangle broader above than long; eyes slightly converging below; apical margin of clypeus slightly incurved medially, with a minute median tubercle; mandibles 4-dentate, the third tooth broadly truncate, a cutting edge between the third and fourth (of the *candida-morosa* type, Pl. XIII); cheeks narrower than eyes, narrowed above, the hind margin carinate; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the second joint slightly longer; mid and hind metatarsi as wide as their tibiae, but distinctly shorter; claws without distinct basal teeth; abdomen cordate, hind margins of the segments not at all depressed; segment six straight laterally in dorsal aspect and in profile, with numerous erect hairs visible in profile, the ventral plate largely bare, but without a distinct bare apical lip.

Puncturation: Fine, close and shallow on cheeks; coarser and widely scattered on vertex laterally, finer and closer medially; rather coarse and close on clypeus except for a conspicuous median impunctate line; scattered on supraclypeal area which also has an impunctate median area; fine and close on mesonotum except in center where punctures are somewhat scattered, the surface between the punctures tessellated; scutellum above finely and closely punctate; pleura below more coarsely and sparsely punctate; punctures very fine and close on abdomen throughout.

Color: Black; antennae dull ferruginous beneath; tegulae ferruginous; wings subhyaline, the nervures fuscous to ferruginous; spurs yellow.

Pubescence: White on face, cheeks, pleura, propodeum, legs, and basal segment of abdomen, with dense white tufts around pronotal tubercles and behind wing bases, a patch of white tomentum behind tegulae, and the scutello-mesothoracic suture white-fasciate; black on vertex, mesonotum, scutellum, and discs of segments two to four of abdomen, and with intermixed black hairs on face and a small patch on upper pleura; segments five and six with whitish tomentum and erect black hairs; segments one to five with whitish apical fasciae, interrupted medially on segment two and widely so on segment one; scopa pale ochraceous, with a few black hairs on segments four and five laterally.

Type.—Female; Rio Frio, Magdalena, Colombia, February 1, 1927, on *Indigofera suffruticosa*, (Salt), [Salt]. *Paratypes.*—7 ♀; topotypical, November, January and February, on *Hibiscus rosasinensis* and *Indigofera suffruticosa*, [Salt].

Megachile aurata new species

Female.—Size: Length, 13 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Face about as long as broad above; eyes slightly converging below; apical margin of clypeus with a minute median denticle, and two or three slightly larger denticulations on each side; mandibles 4-dentate, with cutting edges between the second, third and fourth teeth; cheeks below subequal to eyes in width, narrower above; vertex flat, hind margin incurved; lateral ocelli nearer edge of vertex than to eyes; basal joint of flagellum more than twice the length of the pedicel, and slightly longer than the second joint; apical margins of abdominal segments rather strongly depressed laterally, but only slightly so medially; segment six in profile nearly straight, showing no erect hairs, and the sides nearly straight in dorsal aspect, the ventral plate largely bare, with a distinct apical lip.

Puncturation: Irregularly scattered and of varying sizes on clypeus, supraclypeal area and vertex; finer and closer on cheeks; relatively fine and close on mesonotum laterally and anteriorly, and on scutellum and upper portions of pleura, distinctly separated although numerous on posterior middle of mesonotum; rather coarse on pleura below; very fine and close on abdomen basally, becoming increasingly distinct to segment five, but very minute and densely crowded on segment six.

Color: Black, including tegulae and legs; antennae dark ferruginous beneath; wings lightly infuscated, the nervures fuscous; spurs yellow.

Pubescence: Creamy white on face and cheeks, without any black admixture; long and fuscous on vertex, mesonotum and scutellum; mesonotum with conspicuous whitish pubescence anteriorly, with a more yellowish fascia in the scutello-mesothoracic suture, and a tuft of the same color behind each tegula; pleura, sternum, propodeum and basal segment of abdomen with white pubescence; whitish to yellowish on legs, but brownish-fuscous on outer and anterior faces of front and middle metatarsi; short and black on discs of segments two to six of abdomen, these with entire conspicuous yellow apical fasciae; segment six lacking pale tomentum, with erect black hairs at sides but none visible in profile; scopa entirely fulvous, only the apical fringe on segment six being more fuscous.

Type.—Female; Juanfue, Peru, [Mitchell].

This specimen was received from Dr. Staudinger identified as *M. poeyi* Guerin, but is distinct from that West Indian species to which it is closely allied, however. Specimens of *poeyi* at

hand from Cuba have a much finer and closer puncturation, with red legs, and the scopa is white basally, black on segments five to six.

Megachile limae Schrottky

1913. *Megachile limae* Schrottky, Rev. Mus. Paulista, IX, p. 176.

Pedra Branca and Corumba, Brazil, April, (H. H. Smith), [A. N. S. P., 10 ♀].

Megachile electrum new species (Pl. XIV)

Female.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7 mm.

Structure: Face slightly broader above than long; eyes slightly converging below; apical margin of clypeus subemarginate medially; mandibles 4-dentate, the two apical teeth approximate, cutting edges between the second, third and fourth; cheeks below slightly broader than eyes, narrower above; vertex flat, hind margin slightly incurved; lateral ocelli somewhat nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than either the pedicel or the second joint, which are subequal; mid and hind metatarsi somewhat shorter and narrower than their tibiae; claws with sharp minute basal teeth; abdomen cordate, hind margins of the segments slightly depressed; segment six nearly straight laterally in dorsal aspect, in profile straight with no visible erect hairs, the ventral plate largely bare, with a distinct bare apical lip.

Puncturation: Fine, shallow and rather close on cheeks; fine and close on vertex medially, more distinctly separated laterally; rather sparse medially on clypeus and supraclypeal area, the latter shining; fine and numerous, but distinctly separated on mesonotum and scutellum; fine and close on pleura above, more coarse and sparse below; very minute and close on abdomen, indistinct on basal segments.

Color: Black; antennae brownish-ferruginous beneath; tegulae fuscous; wings slightly infuscated, deeply so in region of radial cell, the nervures fuscous to ferruginous; spurs yellowish.

Pubescence: Whitish on face laterally, on cheeks, mesonotum anteriorly and laterally, on pleura, propodeum, basal segments of abdomen, and on legs in large part; blackish on clypeus, vertex, mesonotum medially, scutellum, with a blackish patch on pleura below tegulae, and short black pubescence on discs of segments three to five of abdomen; mixed light and dark between antennae; segments two to five with rather broad, pale ochraceous, apical fasciae, interrupted or thin medially on segment two; segment six with appressed yellowish tomentum, with a few basal erect black hairs visible at sides; scopa pale yellowish, a few dark hairs on segment six laterally.

Type.—Female; Villarrica, Paraguay, October 1923, [Meyer].
Paratypes.—4 ♀ topotypical, [Meyer].

Megachile indulgens new species (Pl. XIII)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle about as broad as long; eyes slightly converging below; apical margin of clypeus thickened and shining medially, with a small median denticle; mandibles 4-dentate, the teeth acute, cutting edges between the second, third and fourth; cheeks below subequal in width to eyes, narrowed above, the hind margin acute but not carinate; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum longer than the pedicel, subequal in length to the second joint; mid and hind metatarsi slightly narrower and distinctly shorter than the respective tibiae; claws with sharp basal teeth; abdomen cordate, hind margins of the segments strongly depressed laterally but not medially; segment six slightly concave laterally in dorsal aspect, in profile straight with only subappressed hairs visible, the ventral plate largely bare, with a bare apical lip.

Puncturation: Very fine, shallow and close on cheeks and face, irregularly scattered on vertex laterally, sparse and more coarse on vertex medially; somewhat coarse and close on clypeus laterally, but with a quite definite median impunctate line; sparse on supraclypeal area apically; fine and relatively sparse on mesonotum and scutellum, the surface tessellate between punctures; somewhat more coarse and quite close on pleura; fine and close on basal abdominal segments, but becoming very sparse and quite coarse on segment five, close on segment six.

Color: Black; antennae brownish-ochraceous beneath; tegulae ferruginous, with the central area piceous, yellow on anterior margin; wings subhyaline, the nervures piceous; spurs yellowish.

Pubescence: Whitish to pale ochraceous at sides of face, between antennae, on pleura above, around pronotal tubercles, on mesonotum anteriorly and laterally, on propodeum, and basal segment of abdomen; blackish on clypeus, face medially, vertex, mesonotum, scutellum, pleura below, sternum, legs, and discs of segments two to five of abdomen, the latter, as also segment one, apparently with entire ochraceous apical fasciae (specimen in poor condition), segment six with appressed tomentum and with erect black hairs toward the sides, these suberect medially; scopa entirely fulvous.

Type.—Female; Cordova, Argentina, (Davis), [M. C. Z., no. 16201].

Megachile burmeisteri Friese

1908. *Megachile burmeisteri* Friese, Apid. v. Argentina, (Silkeborg), p. 68.
1909. *Megachile burmeisteri* Vachal, Rev. d'Ent., XXVIII, p. 5.
1909. *Megachile burmeisteri* Joergensen, D. Ent. Zeitschr., 1909, p. 215.
1912. *Megachile burmeisteri* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 130.
1920. *Megachile burmeisteri* Cockerell, Proc. U. S. Nat. Mus., LV, p. 221.

Carcarana, Argentina, [A. N. S. P., 1 ♀].

The clypeus and mandibles are somewhat similar to *benigna* (Pl. XIII).

Megachile hieronymi Friese

1908. *Megachile hieronymi* Friese, Apid. v. Argentina, (Silkeborg), p. 67.
1909. *Megachile hieronymi* Joergensen, D. Ent. Zeitschr., 1909, p. 215.
1912. *Megachile hieronymi* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 128.

Neuquen (?), (Dr. Leudl Adolf), [Mitchell, 1 ♀; det. Friese].

Megachile flavihirsuta new species (Pls. X and XII)

Male.—Size: Length, 13 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 10 mm.

Structure: Face about as broad as long; eyes subparallel; apical margin of clypeus shallowly emarginate medially, the emargination irregularly crenulate; mandibles rather long, 3-dentate, the teeth robust, with a slender flattened basal inferior projection which is slightly recurved toward the cheeks; cheeks subequal in width to eyes; vertex slightly convex, hind margin very slightly incurved; lateral ocelli much nearer eyes than to edge of vertex; basal joint of flagellum somewhat longer than the pedicel, the second joint twice the length of the pedicel and about twice as long as broad; front coxae densely pubescent, with moderately long slender spines; front tarsi not dilated; mid and hind metatarsi shorter and narrower than the respective tibiae, mid tibia with an apical spur; abdomen robust, apical margins of the segments strongly depressed; dorsal surface of segment six with a median longitudinal ridge which is more distinct basally, the carina entire, triangular, the apex subtruncate, slightly downcurved, apical margin of the segment with robust carinate median teeth which are approximate to the smaller lateral teeth; segment seven conspicuous, produced medially into a robust triangularly pointed spine; four sternites exposed, the first overlapping and extending almost to the apical margin of the second medially, apical margin of the fourth broadly membranous.

Puncturation: Coarse, close and shallow on cheeks; fine and close on vertex medially, but well separated above eyes where

surface is shining; densely crowded on thorax throughout, rather coarsely so on mesonotum, very fine and close on tegulae; very dense and fine on abdomen throughout.

Color: Black; antennae obscurely reddish beneath; tegulae ferruginous; wings lightly infuscated, very slightly darker apically, the nervures fuscous; legs dark reddish or fuscous; spurs yellowish-ferruginous.

Pubescence: White on cheeks, pleura and sternum, and densely so on front legs posteriorly; ochraceous on vertex and dorsum of thorax, and very densely so on face and clypeus; fulvous, dense and erect on discs of segments one to four of abdomen, segments one to five with dense, entire, ochraceous apical fasciae, discs of segments five and six with dense ochraceous tomentum basally, with numerous erect ochraceous hairs in addition.

Type.—Male; Guadalajara, Mexico, September 14, (McClendon), [A. N. S. P., no. 4126]. *Paratype.*—1 ♂; topotypical, [A. N. S. P.].

This somewhat resembles *M. parallela* Smith in general form, but it is at once distinguished by the entire carina of segment six.

Megachile perihirta Cockerell (?)

1898. *Megachile perihirta* Cockerell, Ann. Mag. Nat. Hist., (7), I, p. 126.
1904. *Megachile grindeliarum* Cockerell, Ent. News, XV, p. 33.
1918. *Megachile perihirta* Sladen, Can. Ent., L, p. 301.
1925. *Megachile perihirta* = *grindeliarum* Cockerell, Proc. Calif. Ac. Sci., (4), XIV, p. 204.
1929. *Megachile perihirta* (intersex) Mitchell, Trans. Am. Ent. Soc., LIV, p. 334.

Guadalajara, Mexico, July, (McClendon), [A. N. S. P., 13 ♀].

These females cannot be distinguished from the females of *perihirta*, but as the females of this and other closely related species are very difficult to separate, it is not at all certain that the specimens are *perihirta*. Males of this group from the same locality would more definitely decide the identity of the species.

Megachile paratexana new name

1878. *Megachile texana* Cresson, Trans. Am. Ent. Soc., VII, p. 125. ♀.
1898. *Megachile texana* Cockerell, Bull. 11, Univ. N. Mex., p. 65.

Type.—Female; Texas, [A. N. S. P., no. 4158]. *Paratypes.*—2 ♀; topotypical.

The male and female originally described as *texana* were erroneously associated; the male, which has been designated as

the type, being conspecific with *generosa* Cresson, while the female is a valid species but must receive a new name. It is related to *perihirta* and *latimanus*, but is easily distinguished from these two species by the black scopa of segments five and six.

Guadalajara, Mexico, (McClendon), [A. N. S. P., 1 ♀].

Megachile colombiana new species (Pls. X and XIII)

Male.—Size: Length, 9 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle about as broad above as it is long; eyes converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with a basal acute inferior projection; cheeks narrower than eyes, simple below; vertex flat, hind margin concave, demarked from the cheeks laterally by a distinct angle above each eye; lateral ocelli nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the following joints more than twice this length, the apical one not dilated, reaching the posterior margin of the thorax; front coxae quite densely pubescent, with strongly diverging spines of moderate length; front femora not distinctly keeled; front tarsi neither dilated nor excavated, but the second and third joints flattened; mid tibia longer than the metatarsus, with an apical spur; abdomen short, broad and rather flat, slightly tapering posteriorly, apical margins of segments four and five depressed both medially and laterally, depressed only laterally on segments two and three; dorsal surface of segment six vertical, the carina quite conspicuous, tapering posteriorly, narrowly rounded on each side of the shallow median emargination, the median carinate teeth of the apical margin of the segment barely evident, the lateral teeth inevident; four sternites exposed, the apical margin of the fourth broadly membranous.

Puncturation: Close and fine on cheeks, pleura, vertex medially, mesonotum anteriorly and laterally, and on scutellum; sparse on vertex laterally and mesonotum medially; very fine and densely crowded on abdomen, more distinctly separated on segment four, segments five and six more rugoso-punctate; tegulae quite closely and minutely punctate.

Color: Black, including antennae, tegulae and legs, but the tibiae slightly reddened apically, and the apical joints of the tarsi obscurely ferruginous; wings slightly infuscated, slightly more so apically and in region of radial cell, the nervures black; spurs yellowish.

Pubescence: Black or fuscous in general aspect, but largely white on face, clypeus and cheeks, with black hairs along upper part of clypeus and at sides of face; also intermixed white and

fuscous on sternum; segment six with dense appressed fuscous tomentum, as also more thinly so on segment five basally; scutello-mesothoracic suture obscurely white fasciate, and sternites two and three with entire white apical fasciae; ventral surface of segment six with thin whitish tomentum.

Female.—Size: Length, 12 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 8 mm.

Structure: Facial quadrangle slightly broader than long; eyes slightly converging below; apical margin of clypeus very slightly incurved medially, otherwise entire; mandibles 4-dentate, the third tooth quite broadly truncate, the two apical ones rounded, a cutting edge between the third and fourth; cheeks considerably narrower than eyes, the posterior margin slightly carinate; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum shorter than the second joint, longer than the pedicel; mid metatarsi slightly shorter and narrower than their tibiae, the joints fringed apically beneath with a row of reddish bristles; hind metatarsi fully as broad, but slightly shorter than their tibiae; basal teeth of claws minute; abdomen broadly cordate, apical margins of the segments not at all depressed; segment six concave laterally in dorsal aspect, very slightly concave in profile, showing short suberect hairs in profile, the ventral plate bare except for the margins, but without a distinct apical lip.

Puncturation: Very sparse on mesonotum medially and vertex laterally; closer on scutellum, on mesonotum laterally and anteriorly, and on vertex medially; coarse and rather close on clypeus and supraclypeal area, but with a median impunctate area; close and very fine on cheeks; fine on pleura, densely crowded above; fine and close on abdomen throughout, densely crowded on segment six.

Color: Black; antennae obscurely brownish-ferruginous beneath; mandibles slightly reddened apically; tegulae shining reddish-piceous; wings uniformly infuscated, the nervures piceous to black; spurs yellowish.

Pubescence: Blackish to fuscous in general, with intermixed white hairs on face and cheeks and some whitish tomentum in the scutello-mesothoracic suture; abdominal segments with dense but inconspicuous apical fasciae of fuscous pubescence, and segment six covered with dense fuscous tomentum and short suberect black hairs; scopa yellowish-white, black laterally on all the segments.

Type.—Male; Cerro Patron, Rio Frio, Magdalena, Colombia, (4000 ft.), September 12, 1927, (Salt), [Salt]. *Allotype.*—Female; Mount San Lorenzo, Santa Marta, Colombia, (4500 ft.), January

1, 1923, (M. A. Carriker), [Salt]. *Paratypes.*—6 ♂, 1 ♀; topotypical. 1 ♀; Mount San Lorenzo, [Salt].

Megachile beniensis Cockerell

1927. *Megachile beniensis* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, pp. 13 & 19.

Chapada, Brazil, October–May, (H. H. Smith), [A. N. S. P., 40 ♂]. Mexico, [A. N. S. P., 1 ♂]. Rio Frio, Magdalena, Colombia, December–May, (Salt, 14 ♂). Uacanzal, (Brazil ?), February, [A. N. S. P., 1 ♂].

The mandibles in this species are quite similar to *colombiana* (Pl. X).

Megachile aetheria new species (Pls. X, XI and XII)

Male.—Size: Length, 9 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus very slightly incurved medially; mandibles 4-dentate, with a slender acute basal inferior projection; cheeks subequal in width to eyes, with a ventral protuberance largely hidden by pubescence; vertex flat, hind margin incurved; lateral ocelli somewhat nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the following joints about twice this length, apical one very slightly dilated and flattened; front coxae bare and polished anteriorly, with short flattened spines and a dense patch of short ferruginous bristles laterad of each spine; front femora not definitely keeled; front tarsi somewhat dilated, the second joint more so than the metatarsus which is slender, slightly incurved on the posterior margin, anterior margin not excavated; mid tibia longer than the metatarsus, without an apical spur, but with a slender, strongly curved, spur-like projection at apex beneath; abdomen somewhat flattened, rather short, slightly tapering apically, apical segments rather strongly depressed on apical margins; dorsal surface of segment six largely hidden beneath segment five, the carina conspicuous, with a median semicircular emargination, rounded on each side of this, apical margin of the segment with barely evident carinate median teeth, the lateral ones inevident; segment seven visible, with a median acute denticle; four sternites exposed, the first and fourth with broadly membranous apical margins.

Puncturation: Fine and close throughout, although not densely crowded, and quite sparse on vertex laterally and rather sparse in center of mesonotum; finer on cheeks and abdomen than on

thorax and other regions of head; extremely minute and scattered on tegulae.

Color: Black; antennae reddish-fuscous beneath; front femora blackish on posterior face except on lower margin, this and the other two faces being yellowish-ferruginous; front tibiae similarly colored, but the outer face more piceous; front tarsi yellowish-ferruginous, second joint with a large black spot beneath; mid and hind legs ferruginous, more or less suffused with fuscous on outer faces; tegulae bronzy-ferruginous; wings faintly infuscated, nervures piceous; segment six of abdomen ferruginous, as also segment five laterally; spurs yellowish.

Pubescence: Dense and entirely ochraceous on face and clypeus, thin on clypeus above; more whitish on cheeks, pleura, sternum, basal segment of abdomen, and legs; thin and fuscous on vertex, mesonotum and scutellum; short and black on discs of segments two to four; segments two to five with rather thin ochraceous apical fasciae, and the scutello-mesothoracic suture thinly white fasciate; segments five and six with rather thin pale ochraceous tomentum and long erect black hairs, these more conspicuous on segment five apically; mid tarsi with long thin white posterior fringes, the front tarsi not definitely fringed.

Type.—Male; Chapada, Brazil, (H. H. Smith), [A. N. S. P., no. 4152]. *Paratypes.*—3 ♂; topotypical, March and April, [A. N. S. P.]

Megachile mexicana Cresson

1878. *Megachile mexicana* Cresson, Trans. Am. Ent. Soc., VII, p. 127.
1911. *Megachile mexicana* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 258.

Mexico, [A. N. S. P., 1 ♀].

This is very close to *M. petulans* Cresson and is possibly nothing more than a geographical race of that species. The mandibles are similar to *colombiana* (Pl. XIII).

Megachile immanis new species (Pl. XIII)

Female.—Size: Length, 14 mm.; breadth of abdomen, 5.5 mm.; anterior wing, 10 mm.

Structure: Face broader than long; eyes subparallel; apical margin of clypeus slightly incurved, with a very slight median denticle; mandibles 4-dentate, the three apical teeth about equally spaced, with a long cutting edge between the third and fourth; cheeks below subequal in width to eyes, slightly narrowed above; vertex flat, hind margin strongly incurved; lateral ocelli considerably nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than pedicel, subequal in length to

second joint, the following ones considerably longer; mid and hind metatarsi, though broad, considerably shorter and narrower than their tibiae; claws with minute, seta-like basal teeth; abdomen cordate, apical margins of the segments not appreciably depressed; segment six slightly concave laterally in dorsal aspect, very slightly so in profile, with numerous erect hairs visible in profile, the ventral plate largely bare, but without a distinct apical lip.

Puncturation: Fine and close on cheeks and face; more coarse and scattered on clypeus which has a median shining impunctate space; widely scattered on vertex laterally, closer medially; fine and scattered on mesonotum, more widely spaced medially; close on scutellum; fine and densely crowded on pleura throughout; minute and very close on abdomen throughout.

Color: Black; antennae more fuscous beneath; mid and hind tibiae and tarsi more or less suffused with red; tegulae yellowish-ferruginous marginally, more fuscous medially; wings faintly infuscated, nervures black; spurs ferruginous; apical margins of ventral abdominal plates ferruginous and the apical one entirely so.

Pubescence: Whitish at sides of face, cheeks, pleura, propodeum and femora; more pale ochraceous on basal segment of abdomen and on legs apically; blackish on vertex, disc of mesonotum, scutellum, discs of segments two to five of abdomen, and black patches on pronotal tubercles and on upper pleura; face medially, and clypeus, with intermixed black and white pubescence, and disc of mesonotum with a fine appressed pale pruinosity in addition to the erect hairs; scutello-mesothoracic suture whitish fasciate; segments one to five of abdomen with entire yellow apical fasciae, narrow on the basal segments but becoming very broad on the apical ones; segment six covered with rather dense yellow tomentum and erect black hairs; scopa pale ochraceous basally, tinged with fulvous apically.

Type.—Female; Buenavista, Bolivia, [Meyer].

Megachile parata new species

Female.—Size: Length, 12 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face broader than long; eyes slightly converging below; apical margin of clypeus slightly incurved, with a barely discernible median denticle; mandibles 4-dentate, third tooth broadly truncate, deeply emarginate between the third and fourth where there is a long cutting edge; cheeks slightly narrower than eyes, but slightly narrowed above; vertex flat, hind margin strongly incurved; lateral ocelli much nearer edge of vertex than

to eyes; basal joint of flagellum very slightly longer than the pedicel, slightly shorter than the second joint; mid and hind metatarsi slightly narrower and considerably shorter than their tibiae; claws without basal teeth; abdomen cordate, apical margin of the segments not at all depressed; segment six very slightly concave laterally in dorsal aspect, in profile straight with numerous erect hairs visible, the ventral plate largely bare, but without a definite apical lip.

Puncturation: Very close and fine on cheeks and face; coarser but close on vertex medially, very sparse laterally; quite close laterally on clypeus and supraclypeal area, but these almost impunctate medially; very close and rather fine on mesonotum, scutellum and pleura throughout; minute and close on abdomen throughout.

Color: Black; antennae obscurely reddish beneath; hind legs more or less suffused with red; tegulae ferruginous; wings faintly clouded, slightly darker apically and on costal margin of radial cell, nervures black or piceous; spurs yellowish.

Pubescence: Pale ochraceous in general, entirely so on face, clypeus, pleura (except for a few dark hairs above), sternum, propodeum, and basal segments of abdomen; more whitish on cheeks and legs; fuscous on vertex, between antennae, on disc of mesonotum, and on scutellum, the mesonotum with very short pale pubescence in addition to the longer dark hairs; scutello-mesothoracic suture yellowish fasciate; pubescence on segments one and two long and ochraceous, on segments three and four very short and ochraceous, tending to fuscous on segment five, all of these segments with entire ochraceous apical fasciae, those on segments four and five somewhat broader than on basal segments; segment six with dense ochraceous tomentum and erect blackish pubescence; scopa pale ochraceous throughout.

Type.—Female; Buenavista, Bolivia, [Meyer].

This is very close to *immanis*, but differs in its smaller size, in the denser puncturation of the mesonotum, and in the uniformly ochraceous pubescence.

Megachile subita new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7 mm.

Structure: Face slightly broader above than long; eyes slightly converging below; apical margin of clypeus incurved medially, with a very slight median denticle; mandibles 4-dentate, the third tooth broadly truncate, with a long cutting edge between the third and fourth; cheeks narrower than eyes, slightly carinate on hind margin above where they are somewhat narrowed;

vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than the pedicel, shorter than the second joint; mid and hind metatarsi fully as wide as their tibiae, but definitely shorter; claws without basal teeth; abdomen cordate, hind margins of the segments not depressed; segment six very slightly concave laterally in dorsal aspect, in profile straight with numerous erect hairs visible, the ventral plate largely bare, but without an apical lip.

Puncturation: Fine and shallow on cheeks, sparse below; rather close on vertex medially but very sparse laterally; close laterally on clypeus and supraclypeal area, but largely impunctate medially; rather fine and distinctly separated on mesonotum medially, closer laterally and on scutellum; fine and close on pleura above, but coarser and definitely separated below; uniformly close and minute on abdomen throughout.

Color: Black; antennae obscurely ferruginous beneath; mandibles obscurely reddish; tegulae reddish-piceous, polished; wings subhyaline, slightly darker apically and in radial cell, nervures piceous; hind legs entirely ferruginous, the front ones piceous, the middle pair intermediate; spurs yellowish.

Pubescence: Whitish on cheeks, pleura and legs; more pale ochraceous on propodeum and basal segment of abdomen, with dense ochraceous patches around pronotal tubercles, behind wing bases, and at posterior lateral angles of mesonotum, the scutello-mesothoracic suture ochraceous fasciate; fuscous on vertex, mesonotum and scutellum, with a fuscous patch on upper pleura and fuscous tufts on pronotal tubercles; mesonotum with short inconspicuous pale pubescence in addition to the longer dark hairs; face and clypeus with intermixed blackish and white pubescence; short and blackish on discs of segments two to four of abdomen, segments five and six with yellowish tomentum and erect black hairs; segments one to five with entire but rather narrow yellowish apical fasciae; scopa entirely pale ochraceous.

Type.—Female; Chapada, Brazil, (H. H. Smith), [A. N. S. P., no. 4153]. *Paratypes.*—7 ♀ ; topotypical, November, March and May, [A. N. S. P.]. 5 ♀ ; Buenavista, Bolivia, [Meyer].

The legs are more blackish in these latter paratypes, but otherwise they seem to be identical.

Megachile inconstans new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 6.5 mm.

Structure: Face broader than long; eyes slightly converging below; apical margin of clypeus slightly incurved medially, with-

out a definite median denticle; mandibles 4-dentate (of the *colombiana* type, Pl. XIII), the third tooth broadly truncate, with a cutting edge between the third and fourth; cheeks narrower than eyes, slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum longer than the pedicel, subequal in length to the second joint; mid and hind metatarsi shorter than their tibiae, but subequal to them in width; claws without evident basal teeth; abdomen cordate, the hind margins not at all depressed; segment six nearly straight laterally in dorsal aspect, in profile straight with numerous erect hairs visible, the ventral plate largely bare, but without a bare apical lip.

Puncturation: Very close and fine on cheeks and face; rather close on vertex medially, but sparse laterally; rather close and fine on clypeus and supraclypeal area laterally, but these with definite median impunctate areas; sparse on mesonotum medially, but fine and close laterally and anteriorly, as also on scutellum; very fine and densely crowded on pleura above, coarser and more definitely separated below; very fine and close on abdomen throughout.

Color: Black; antennae somewhat purplish-brown beneath; tegulae ferruginous; wings quite deeply and uniformly infuscated, the nervures black; spurs yellowish.

Pubescence: White on cheeks, pleura, propodeum, legs, and basal segment of abdomen; thin and black on vertex, mesonotum, scutellum, and discs of segments two to four of abdomen; the scutello-mesothoracic suture subfasciate; intermixed black and white on face and clypeus; segments five and six with short greyish pilosity and longer erect black hairs; segments one to five with narrow, entire, greyish-white apical fasciae, broader laterally and on the apical segments; scopa entirely pale ochraceous.

Type.—Female; Buenavista, Bolivia, [Meyer].

Megachile angularis new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 7 mm.

Structure: Face broader than long; eyes slightly converging below; apical margin of clypeus slightly incurved medially, with the slightest indication of a median denticle; mandibles 4-dentate (of the *colombiana* type, Pl. XIII), the third tooth broadly truncate, a long cutting edge between the third and fourth; cheeks narrower than eyes, slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum considerably longer than the pedicel, subequal in length to the second joint; mid and hind

metatarsi slightly narrower and distinctly shorter than their tibiae; claws without distinct basal teeth; abdomen cordate, hind margins of the segments not depressed; segment six slightly concave laterally in dorsal aspect, in profile straight with numerous visible erect hairs, the ventral plate largely bare, with only a very low and inconspicuous bare apical lip.

Puncturation: Fine, shallow and rather close on the shining cheeks; deeper on vertex, rather close medially, more sparse laterally; close and rather coarse on clypeus and supraclypeal area laterally, rather sparse medially, but clypeus without a definite impunctate area; close and rather fine but not crowded on mesonotum and scutellum; more densely crowded on pleura; very fine and close on abdomen basally, becoming somewhat more coarse and distinctly separated on segment five, very close and fine on segment six.

Color: Black; antennae more brownish beneath; tegulae reddish-piceous; wings subhyaline, nervures ferruginous to blackish; legs more or less suffused with red; spurs yellowish.

Pubescence: White at sides of face and below antennae, on cheeks, pleura, propodeum, legs, and basal segment of abdomen; more yellowish, with intermixed long black hairs on clypeus, and mixed black and white between antennae; black on vertex, mesonotum and scutellum, and discs of abdominal segments two to five with very short black pubescence, these with narrow, entire, white apical fasciae; segment six with an extremely fine whitish pilosity and longer erect black hairs; scopa white, black laterally on segment six.

Type.—Female; (locality label impossible to decipher), [Meyer].

Megachile numerus new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 7 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus slightly incurved, with a very slight median denticle; mandibles 4-dentate (of the *colombiana* type, Pl. XIII), the third tooth broadly truncate, deeply emarginate between the third and fourth where the cutting edge is located; cheeks narrower than eyes, narrowed above; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than pedicel, subequal in length to the second joint; mid and hind metatarsi fully as broad as their tibiae, but considerably shorter; claws without basal teeth; abdomen cordate, apical margins of the segments not at all depressed; segment six very slightly concave laterally in dorsal aspect, in profile straight, with numerous

visible erect hairs, the ventral plate largely bare on apical portion, but without a distinct apical lip.

Puncturation: Fine and close on cheeks and vertex medially, very sparse on vertex laterally; coarse and scattered on clypeus, which has a median impunctate line; scattered but fine on supraclypeal area; rather widely spaced on mesonotum medially, closer laterally and anteriorly; minute and sparse on scutellum medially, fine and very close laterally; fine and close on pleura above, coarse and more distinctly separated below; very fine and close on abdomen throughout.

Color: Black; antennae obscurely ferruginous beneath; tegulae reddish-piceous, more ferruginous on anterior margin; wings slightly infuscated, nervures piceous to black; spurs yellowish.

Pubescence: Whitish on cheeks, pleura, sternum, propodeum, legs, and basal segment of abdomen, and a conspicuous white tuft around each pronotal tubercle and at posterior lateral angles of mesonotum; mixed black and white on face and clypeus; blackish or fuscous on vertex, disc of mesonotum, scutellum, with a black patch on each pleuron above and a conspicuous fuscous tuft between antennae and on each pronotal tubercle; scutellomesothoracic suture subfasciate; pubescence very short and blackish on discs of abdominal segments, these with only very thin inconspicuous pale apical fasciae; segment six with greyish appressed pubescence and fine erect black hairs; scopa pale ochraceous with the exception of a few black hairs on segment six apically.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratypes.*—8 ♀; topotypical. 2 ♀; Tapyta, Paraguay, November, 1925, [Meyer].

Megachile emendata new species

Female.—Size: Length, 13 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face broader than long; eyes slightly converging below; apical margin of clypeus practically straight, with a very minute median denticle, otherwise entire; mandibles 4-dentate, third tooth broadly truncate, with a long cutting edge between the third and fourth; cheeks narrower than eyes, slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than pedicel, subequal in length to second joint; mid and hind metatarsi subequal in width to their tibiae, but considerably shorter; claws without definite basal teeth; abdomen cordate, apical margins of the segments not depressed; segment

six very slightly concave laterally in dorsal aspect, in profile straight with numerous erect black hairs visible, the ventral plate largely bare, but without a bare apical lip.

Puncturation: Very close and fine on cheeks and face; more coarse on vertex where the punctures are close medially but very sparse laterally; scattered on clypeus and supraclypeal area laterally, but these almost impunctate medially; separated to a slight degree on mesonotum medially, but otherwise densely crowded on mesonotum, scutellum and pleura; very minute and close on abdomen basally, becoming slightly more coarse and less close apically.

Color: Black; antennae deep ferruginous below; mandibles obscurely reddish apically; tegulae pale ferruginous; wings subhyaline, slightly infuscated apically, nervures deep ferruginous to piceous; legs more or less suffused with red; spurs yellowish.

Pubescence: Whitish on cheeks and pleura; more pale ochraceous on legs, propodeum and basal segments of abdomen, with dense ochraceous fringes around pronotal tubercles and large tufts behind wing bases, the scutello-mesothoracic suture only thinly fasciate; fuscous to black on vertex, mesonotum and scutellum, with fuscous patches on pleura above and a similar tuft on each pronotal tubercle, the mesonotum also with short pale hairs intermixed; intermixed pale and blackish hairs on face and clypeus; intermixed blackish and ochraceous and very short on discs of middle abdominal segments, more blackish on segment five; segments one to five with entire pale ochraceous apical fasciae, these but slightly broader on apical segments; segment six with ochraceous tomentum and erect blackish hairs; scopa ochraceous except for a few lateral black hairs on segment six.

Type.—Female; Chapada, Brazil, March, (H. H. Smith), [A. N. S. P., no. 4154]. *Paratypes.*—10 ♀; topotypical, October, March and April, [A. N. S. P.].

Megachile brasiliensis Dalla Torre

1853. *Megachile denticulata* Smith (nec Fairmaire), Cat. Hym. Brit. Mus., I, p. 185.
1896. *Megachile brasiliensis* Dalla Torre, Cat. Hymen., X, p. 422.
1913. *Megachile denticulata* Schrottky, Rev. Mus. Paulista, IX, p. 213.
1920. *Megachile brasiliensis* Schrottky, Rev. Mus. Paulista, XII, p. 201.
1927. *Megachile brasiliensis* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, p. 13.

Chapada, Brazil, January and April, (H. H. Smith), [A. N. S. P., 26 ♂; compared with type, (Waterston)].

Megachile anthidioides Radoszkowski (Pls. X and XII)

1874. *Megachile anthidioides* Radoszkowski, Bull. Soc. Nat. Moscou, XLVII, p. 147.
1879. *Megachile anthidioides* Smith, Descr. N. Sp. Hymen. Brit. Mus., p. 78.
1902. *Megachile anthidioides* Schrottky, Rev. Mus. Paulista, v, p. 437.
1905. *Megachile anthidioides* Cockerell, Trans. Am. Ent. Soc., XXXI, p. 341.
1908. *Megachile anthidioides* Friese, Apid. v. Argentina, (Silkeborg), p. 64.
1912. *Megachile anthidioides* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 124.
1913. *Megachile anthidioides* Schrottky, Rev. Mus. Paulista, IX, p. 180.
1920. *Megachile anthidioides* Schrottky, Rev. Mus. Paulista, XII, p. 198.

Puerto Bertoni, Alto Parana, Paraguay, [M. C. Z., 1 ♂; det. Schrottky].

Megachile prudens new species

Male.—Size: Length, 8.5 mm.; breadth of abdomen, 3 mm.; anterior wing, 6 mm.

Structure: Face longer than broad; eyes converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with a basal acute inferior projection (somewhat similar to *colombiana*, Pl. X); cheeks subequal in width to eyes, simple below; vertex flattened, hind margin slightly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than the pedicel, the following joints about twice this length; front coxae rather densely pubescent anteriorly, with moderately long spines; front femora slightly keeled beneath apically; front tarsi not dilated, but the metatarsus excavated on anterior margin; mid tibia longer than the metatarsus, without an apical spur; abdomen rather short and broad, somewhat flattened, apical margins of the segments rather narrowly depressed, more deeply so on apical segments; dorsal surface of segment six vertical in position, the carina with a small rounded median emargination, obtuse on each side of this, the apical margin of the segment with low but evident lateral teeth but without median teeth; segment seven inevident; four sternites exposed.

Puncturation: Fine and close in general, being densely crowded on face, clypeus, mesonotum and scutellum; more distinctly separated but close on vertex and pleura; rather coarse but shallow on cheeks; minute and close on abdomen; hardly evident on tegulae; irregularly scattered on legs.

Color: Black in general; antennae deep reddish above, more ferruginous beneath; legs and tegulae entirely ferruginous; wings pale yellowish, the nervures brownish-yellow; spurs pale yellowish.

Pubescence: Ochraceous on vertex, thorax above and abdomen, becoming more whitish on face, cheeks, pleura and sternum; face with intermixed black hairs; segments four and five with short inconspicuous black hairs; segments one to five with entire, rather broad and dense, ochraceous apical fasciae; segment six rather densely covered with greyish tomentum, with a few scattered, erect dark hairs; tarsi without evident fringes, the pubescence more golden.

Type.—Male; Chapada, Brazil, (H. H. Smith), [A. N. S. P., no. 4155].

Megachile continua new species (Pls. X and XI)

Male.—Size: Length, 8 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face about as broad above as it is long; eyes slightly converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with a rather small acute basal inferior projection; cheeks about as broad as eyes, simple below; vertex flat, hind margins slightly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than pedicel, the following joints slightly more than twice the length of the pedicel, the apical one not dilated; front coxae thinly pubescent anteriorly, with rather short spines but no red bristles; front femora not distinctly keeled; front tarsi slender, not dilated, but slightly excavated on anterior margin; mid tibia longer than the metatarsus, with neither an apical spur or spine or protuberance; hind legs slender; abdomen rather short and broad, apical margins of the segments quite broadly and deeply depressed; segment six ventral in position, the carina rather low, rounded on each side of the median emargination, the apical margin of the segment with widely separated carinate median teeth, lateral teeth inevident; segment seven inevident; four sternites exposed.

Puncturation: Densely crowded on mesonotum, scutellum and pleura; shallow and close on cheeks; close and fine on clypeus and on vertex medially, with irregular small shining spaces on vertex laterally; minute and close on abdomen throughout, segment six finely rugoso-punctate, with scattered minute tubercles; tegulae with very minute indistinct scattered punctures.

Color: Black; antennae deep ferruginous; legs, tegulae and ventral portion of basal abdominal segment lighter ferruginous; mandibles obscurely reddish apically; wings yellowish, more hyaline apically, nervures yellowish-ferruginous; spurs yellow.

Pubescence: White on face, cheeks below, sternum, and basal leg joints, with numerous intermixed black hairs on face; fulvous on vertex and quite densely so on dorsum of thorax, paling to ochraceous on pleura; long and ochraceous on basal segment of abdomen, very short and ochraceous on discs of segments two to four, segment five with dense ochraceous tomentum basally and a few short erect black hairs; segments one to four with quite broad ochraceous apical fasciae, and a paler narrower one on segment five; segment six without tomentum, with only scattered erect blackish hairs; sternites one to three with white apical hair fringes; tarsal fringes very short, ochraceous, the apical leg joints with very short ochraceous pubescence.

Type.—Male; Chapada, Brazil, December, (H. H. Smith), [A. N. S. P., no. 4156]. *Paratypes.*—5 ♂; topotypical, December, January and April, [A. N. S. P.].

Megachile squalens Haliday

1836. *Megachile squalens* Haliday, Trans. Linn. Soc. London, XVII, p. 320.
1902. *Megachile apicipennis* Schrottky, Rev. Mus. Paulista, V, p. 442.
1908. *Megachile pleuralis* Vachal, Rev. d'Ent., XXVI, p. 237.
1909. *Megachile pleuralis* Vachal, Rev. d'Ent., XXVIII, p. 5.
1913. *Megachile squalens* Schrottky, Rev. Mus. Paulista, IX, p. 195.
1923. *Megachile squalens* Cockerell, Ann. Mag. Nat. Hist., (9), XI, p. 457.

Chapada, Brazil, December, January, March, August, (H. H. Smith), [A. N. S. P., 28 ♂]. Tapyta, Paraguay, November 1925, [Meyer, 1 ♂].

Megachile digna new species (Pl. XII)

Male.—Size: Length, 8 mm.; breadth of abdomen, 3 mm.; anterior wing, 6 mm.

Structure: Face longer than broad; eyes slightly converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, with an acute basal inferior projection; cheeks subequal in width to eyes, simple below; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum slightly longer than the pedicel, the following joints twice this length, apical one not dilated; front coxae largely bare anteriorly, with flattened spines of moderate length; front femora not strongly keeled; front tarsi not dilated, but the metatarsus quite deeply excavated on anterior margin; mid tibia slightly longer than the narrow metatarsus, without an apical spur, but with a very short inconspicuous apical spine; hind tarsi narrow; abdomen short, broad and rather flat, apical margins of the segments slightly depressed; dorsal surface of segment six vertical, the carina quite

conspicuous, roundly emarginate medially; the apical margin of the segment without evident median teeth, the lateral teeth evident; tip of segment seven barely evident; four sternites exposed.

Puncturation: Close in general on head and thorax; fine and close on face and on vertex medially, more distinct on vertex laterally; shallow on cheeks, close above, more distinctly separated below; fine and densely crowded on mesonotum and scutellum; close on pleura, fine above, more coarse below; very fine on the shining abdomen, close basally, rather sparse on segment four, but close and fine on segments five and six.

Color: Black; antennae and legs more reddish-fuscous, apical joints of the tarsi brownish-yellow; wings subhyaline, nervures and tegulae yellowish-ferruginous; spurs yellowish.

Pubescence: Fulvous on vertex, thorax above and basal segments of abdomen, more ochraceous and dense over entire face; pale ochraceous to whitish on cheeks, sternum, and on legs; blackish on discs of segments four and five, and apically and laterally on segment three; segments two to five with thin inconspicuous pale ochraceous apical fasciae; segment six with rather dense whitish tomentum and scattered erect but inconspicuous dark hairs; sternites one to three with broad white apical fasciae, and the fourth with a narrow interrupted white fascia.

Type.—Male; Chapada, Brazil, March, (H. H. Smith), [A. N. S. P., no. 4144].

Megachile paraxanthura Cockerell

1914. *Megachile paraxanthura* Cockerell, Ann. Mag. Nat. Hist., (8), XIII, p. 428.

Villarrica, Paraguay, [Meyer, 1 ♂]. Cordova, Argentina, (Davis), [M. C. Z., 1 ♂].

The mandibles resemble those of *anthidioides* (Pl. X), while the mid tibia is much as in *continua* (Pl. XII).

Megachile angusta new species

Male.—Size: Length, 7 mm.; breadth of abdomen, 2 mm.; anterior wing, 5.5 mm.

Structure: Face longer than broad; eyes slightly converging below; apical margin of clypeus entire; mandibles 4-dentate, with a triangular acute sub-basal inferior projection (similar to *anthidioides*, Pl. X); cheeks as broad as eyes, simple below; vertex slightly rounded, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum equal in length to pedicel, the following joints twice this length,

apical one not dilated; front coxae thinly pubescent anteriorly, with short spines having rounded tips; front legs slender, the tarsi narrow, but the metatarsus slightly excavated anteriorly; the four posterior legs slender, mid tibia longer than the metatarsus, with neither an apical apur nor a spine-like projection (as in *continua*, Pl. XII); abdomen narrow and parallel-sided, apical margins of the segments narrowly depressed; segment six hidden by segment five in dorsal aspect, the carina directed ventrally, rather low, with a rather small semicircular median emargination, median teeth of the apical margin of the segment inevident, the lateral ones just visible; segment seven inevident; four sternites exposed.

Puncturation: Dense on face and clypeus; shallow but close on cheeks; close but distinct on vertex medially, more sparse laterally, the surface shining; sparse medially on the dull mesonotum, fine and densely crowded laterally and anteriorly; rather sparse on the more shining clypeus; dense on pleura, especially above; minute and relatively sparse on the shining abdomen, but very close on segment five; minute and scattered on tegulae.

Color: Black; antennae and tegulae more fuscous; apical joints of tarsi brownish-ferruginous; wings slightly infuscated, quite deeply so in region of radial cell, the nervures fuscous; spurs pale yellow.

Pubescence: Whitish on face, clypeus, cheeks, sternum and legs, with intermixed long black hairs on clypeus and between antennae; blackish on vertex, mesonotum, scutellum, pleura above, and basal abdominal segment, with patches of long white hairs in front of and behind wing bases; short, thin and black on discs of segments two to five, segments one to four with evidences of white apical fasciae at sides, and segment five with an entire white fascia; segment six covered with dense white tomentum, with a few erect black hairs; sternites two and three with entire white apical hair fringes; tarsal fringes very short and thin, blackish on front metatarsus, entirely white on mid tarsi.

Type.—Male; Prieta, Rep. Honduras, April 5, 1924, [Meyer].

Megachile concava new species (Pls. X and XI)

Male.—Size: Length, 12 mm.; breadth of abdomen, 4 mm.; anterior wing, 9 mm.

Structure: Face about as broad as long; eyes subparallel; clypeus bare above, apical margin slightly crenulate medially; mandibles 3-dentate, without an inferior projection, the outer face deeply concave, the concavity bordered by sharp ridges above and below; cheeks broader than eyes medially, with a large polished non-pubescent, slightly concave area below; vertex

slightly rounded, hind margin incurved; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum about as long as the pedicel, the other joints twice this length, the apical one flattened and very broadly dilated; front coxae bare and polished anteriorly, with robust, flattened, strongly divergent spines which are rounded apically, a small patch of ferruginous bristles in front of each spine; front femora not keeled; front tarsi broadly dilated and much flattened, the metatarsi concave on anterior margin, this joint about as long as broad, and each of joints two to four much broader than long; mid tibia about twice as long as the metatarsus, with the usual apical spur; hind femora robust, the metatarsi short and slightly bowed; apical margins of abdominal segments slightly depressed; dorsal surface of segment six vertical in position, the carina low, broadly and roundly emarginated medially, sharply pointed on either side, with a low dentiform protuberance located obliquely above on each side, apical margin of the segment with carinate median teeth, which are nearer to the acute lateral teeth than to each other; four sternites exposed.

Puncturation: Fine and close in general, especially on cheeks and basal abdominal segments; more coarse and sparse on clypeus above; and segment six very finely rugoso-punctate.

Color: Black; antennae dull ferruginous; anterior surface of front coxae pale yellowish in part, the front femora and tibiae ferruginous, the metatarsi blackish anteriorly, ferruginous posteriorly, joints two to five ivory, the second partly blackish in front; mid and hind legs entirely black; tegulae pale ferruginous; wings uniformly yellowish, the nervures ferruginous; front spurs pale yellowish, the others deep red.

Pubescence: Entirely pale ochraceous on face, vertex, cheeks and thorax; mandibles with a conspicuous pencil of blackish pubescence at base below, and the lower margin of the concave area of the cheeks with a shorter dense tuft of ferruginous hairs; pubescence of legs largely pale, the anterior tarsus with a thin ochraceous fringe posteriorly; segment one and base of segment two of abdomen with ochraceous pubescence, discs of segments three to five short black pubescent, with very broad ochraceous apical fasciae, more or less interrupted medially; segment six with scattered erect black hairs and very inconspicuous silvery pilosity; sternites one to three thinly pale pubescent, the fourth bare and polished.

Type.—Male; Villarrica, Paraguay, [January ?] 1, 1922, [Meyer].

Megachile aurea new species (Pls. XI and XII)

Male.—Size: Length, 10 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 8 mm.

Structure: Face longer than broad; eyes subparallel; apical margin of clypeus entire; mandibles 3-dentate, without an inferior projection; cheeks broader than eyes, at least below, and simple below; vertex almost flat, hind margin very slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the following joints about twice as long, the apical one flattened and rather broadly dilated; front coxae thinly pubescent anteriorly, with very short diverging spines, and with a conspicuous patch of red bristles at the base of each spine; front femora without a distinct keel; front tarsi dilated but not excavated, the second joint subequal to the metatarsus in length; mid tibia twice the length of the metatarsus, with an apical spur; abdomen rather short and broad, the sides subparallel, apical margins of the segments slightly depressed; dorsal surface of segment six vertical, the carina prominent, very slightly crenulate laterally, with a semicircular median emargination, apical margin of the segment with barely evident median teeth, the lateral ones inevident; segment seven barely evident, triangularly pointed; four sternites exposed.

Puncturation: Very close and rather fine on head and thorax; extremely dense and fine on cheeks; minute and inconspicuous, but rather close on the shining abdomen, very close on segment six; minute and rather close on tegulae; variable on legs, but mostly fine on femora, coarse on the tibiae.

Color: Head and thorax black; antennae, including the scape, legs, spurs, tegulae, and entire abdomen ferruginous, the antennae rather deeply so, the front metatarsus rather yellowish-ferruginous, the second and following joints rather distinctly yellowish; wings faintly yellowish, the nervures yellowish-ferruginous.

Pubescence: Dense and white on face, with a few intermixed black hairs on clypeus above; quite dense and fulvous on dorsum of thorax and vertex; more ochraceous on cheeks below, on pleura, propodeum, legs and basal abdominal segments; whitish on sternum and on cheeks above where it is very short and thin; lower margin of mandibles with a long dense ochraceous fringe basally; apical segments of abdomen with very thin scattered whitish tomentum and erect black hairs; posterior fringe of front tarsi creamy-white, tipped with fuscous, ferruginous basally beneath, otherwise fuscous; mid tarsi with a very thin long white posterior fringe; hind tarsi fringed in front and behind with black hairs.

Type.—Male; Buenavista, Bolivia, [Meyer].

Megachile jucunda new species (Pl. XI)

Male.—Size: Length, 9 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face longer than broad; eyes slightly converging below; apical margin of clypeus incurved medially; mandibles 3-dentate, without an inferior projection; cheeks below broader than eyes, with a large non-pubescent area below, but not tuberculate; vertex slightly rounded, hind margin very slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal to pedicel in length, the following joints about twice as long as broad, the apical one very slightly dilated; front coxae bare anteriorly, with a large patch of long, bright red bristles, the spines quite long and rather narrow, somewhat flattened, slightly curved forward; front femora hardly keeled apically; front tibiae short, about half as broad as long; front tarsi widely dilated, the metatarsus almost as wide as long, with the anterior margin deeply excavated, the other joints about as broad as long; mid tibia longer than the metatarsus, with an apical spur; abdomen short and broad, apical margins of the segments narrowly depressed; dorsal surface of segment six vertical in position, with a rather low but large central protuberance, the carina rather low, irregularly crenulate or subemarginate, apical margin of the segment with carinate median teeth, the lateral teeth inevident; segment seven barely visible, pointed medially; four sternites exposed.

Puncturation: Close and fine in general; sparse and rather coarse on the shining upper half of the clypeus; fine and densely crowded on cheeks, vertex, mesonotum, pleura, and basal abdominal segments; more distinct on scutellum and apical segments of abdomen, but minute and crowded on segment six; minute and scattered on tegulae.

Color: Black in general; antennae brownish-ferruginous beneath; front coxae and trochanters yellowish on anterior surfaces, the femora yellowish on lower surfaces, blackish above, the tibiae blackish on outer face basally, becoming yellowish apically, the inner faces yellowish or ferruginous, the tarsi dull yellowish; mid femora and tibiae largely blackish, the tibiae reddish on outer face apically; mid and hind tarsi ferruginous, the hind legs otherwise blackish; tegulae yellowish-ferruginous; wings uniformly moderately infuscated, violaceous apically, the nervures fuscous to brownish; spurs ferruginous.

Pubescence: Ochraceous on face, cheeks above, and thinly so on legs, the upper half of the clypeus largely bare; fulvous on vertex, thorax above where it is dense, on pleura above, and on the basal abdominal segment; blackish on discs of segments

three to five, and on segment two laterally; segment six with short thin greyish tomentum, segments three to five with entire fulvous apical fasciae; bare area at lower angle of cheeks fringed with long, dense ochraceous or creamy pubescence; front coxae, trochanters and femora with long dense whitish pubescence posteriorly; front tarsi with a pale ochraceous posterior fringe, tipped with fuscous.

Type.—Male; Buenavista, Bolivia, [Meyer].

Megachile aequalis new species (Pls. X and XI)

Male.—Size: Length, 14 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 10 mm.

Structure: Face about as broad as long; eyes subparallel; apical margin of clypeus slightly emarginate medially; mandibles 3-dentate, with an inferior projection; cheeks as broad as eyes with a robust triangular projection beneath base of mandible; vertex flat, hind margin slightly incurved; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum slightly longer than pedicel, the following joints twice the length of the basal one, the apical one not dilated; front coxae bare anteriorly, with rather long tapering acute spines, without red bristles; front femora not keeled; front tarsi somewhat dilated, but not excavated on anterior margin; mid tibia twice the length of the metatarsus, with an apical spur; hind legs ordinary; abdomen parallel-sided, apical margins of the segments rather broadly depressed; dorsal surface of segment six vertical in position, slightly protuberant medially, the carina broadly and roundly emarginate medially, the apical margin of the segment with the teeth inevident; segment seven barely evident, with a small median denticle; four sternites visible.

Puncturation: Fine and quite close in general; shallow but quite close on cheeks; close but distinct on vertex, mesonotum and pleura above; more sparse on scutellum and pleura below; minute and close on abdomen, densely crowded on segment six; minute and close on tegulae.

Color: Black; antennae dull ferruginous beneath; mandibles, tegulae and abdomen beneath ferruginous; wings yellowish, nervures brownish-yellow; spurs ferruginous.

Pubescence: Fulvous on vertex and thorax above; more ochraceous on sides of face and on cheeks, pleura, basal segment of abdomen, and legs; clypeus with erect black hairs and long appressed ochraceous pubescence; whitish above clypeus between antennae; blackish on discs of segments two and three of abdomen, with a slight amount on segment four, segment five largely covered with dense ochraceous tomentum, and segments two and three with similar tomentum basally; segments five and six with

erect black hairs, and segment six with a very fine whitish pilosity; segments one to four with entire dense apical fasciae; front tarsi with rather short dense ochraceous posterior fringes, the mid tarsi with similar long thin fringes.

Type.—Male; Chapada, Brazil, November, (H. H. Smith), [A. N. S. P., no. 4133]. *Paratypes.*—5 ♂; topotypical, [A. N. S. P.].

Megachile blanda new species (Pls. X, XI and XII)

Male.—Size: Length, 8.5 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 6.5 mm.

Structure: Face slightly broader above than long; eyes converging below; apical margin of clypeus entire; mandibles 3-dentate, without an inferior projection; cheeks subequal to eyes in width, simple below; vertex slightly rounded, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal to pedicel in length, the following joints hardly twice as long (apical one missing); front coxae thinly pubescent anteriorly, with short slender spines; front tarsi dilated, but not excavated, the second joint subequal to the metatarsus in length, both of them narrow basally, much dilated apically; mid tibia twice as long as the metatarsus, with an apical spur; hind legs slender; abdomen slightly narrowed posteriorly, apical margins of the segments depressed laterally; dorsal surface of segment six vertical in position, the carina rather conspicuous, irregularly crenulate, subemarginate medially, the median carinate teeth and the lateral acute ones of the apical margin of the segment barely evident; segment seven hardly evident; four sternites visible.

Puncturation: Densely crowded on mesonotum and pleura, but more distinctly separated on scutellum; very close on vertex, becoming very fine and rather close on cheeks; close and fine on clypeus above; minute and very close on abdomen throughout; tegulae almost impunctate.

Color: Black; antennae more fuscous beneath; legs more or less suffused with dark red, the front tarsi yellowish-ferruginous, as also the inner faces of the front femora and tibiae; tegulae yellowish-ferruginous; wings uniformly and slightly infuscated, the nervures ferruginous basally, fuscous apically; spurs ferruginous to piceous.

Pubescence: Dense and pale ochraceous on lower half of clypeus, at sides of face, and between antennae, and very thinly so on vertex and mesonotum; black on upper half of clypeus and below each antenna; fuscous on pleura above, on propodeum above, and on posterior portion of scutellum; more whitish on cheeks, pleura below and sternum; short, ochraceous to silvery

on legs, more or less fuscous on outer faces of mid metatarsi; blackish and mostly short on segments one to three of abdomen, segment five entirely covered with dense yellow tomentum, with longer erect black hairs, and segment four with similar tomentum apically, segment six with appressed silvery pubescence and short erect black hairs, segment three with an apical yellow fascia; sternites two to four with whitish apical hair fringes; tarsal fringes hardly evident.

Type.—Male; Chapada, Brazil, March, (H. H. Smith), [A. N. S. P., no. 4143].

Megachile tapytensis Mitchell

1929. *Megachile tapytensis* Mitchell, Trans. Am. Ent. Soc., LIV, p. 335.

Tapyta, Paraguay, [Mitchell, 1 paratype ♂].

The mandibles are much like those of *aequalis* (Pl. X).

Megachile guaranitica Schrottky

1908. *Megachile guaranitica* Schrottky, Anal. Soc. Cien. Argentina, LXV, p. 236.
1908. *Megachile guaranitica* var. *catamarcensis* Schrottky, Anal. Soc. Cien. Argentina, LXV, p. 237.
1908. *Megachile gomphrenae* and var. Friese, Apid. v. Argentina, (Silkeborg), p. 64.
1909. *Megachile guaranitica* var. *catamarcensis* Schrottky, Anal. Soc. Cien. Argentina, LXVIII, p. 268.
1912. *Megachile catamarcensis* Joergensen, Zool. Jahrb., Abth. Syst., XXXII, p. 124.
1913. *Megachile guaranitica* Schrottky, Rev. Mus. Paulista, IX, p. 168.
1920. *Megachile guaranitica* Schrottky, Rev. Mus. Paulista, XII, p. 199.

Ampajango, Argentina, December 1–6, 1920, (2300 m.), [Mitchell, 1 ♀; det. Hedicke]. Cordoba and La Rioja, Argentina, [M. C. Z., 5 ♂]. Corumba, Brazil, April, (H. H. Smith), [A. N. S. P., 1 ♀].

The mandibles of the female are somewhat similar to *conjugalis* (Pl. XIV).

Megachile congruens new species (Pl. XI)

Male.—Size: Length, 8 mm.; breadth of abdomen, 3 mm.; anterior wing, 6 mm.

Structure: Face longer than broad; eyes slightly converging below; apical margin of clypeus with a slight median emargination which has a small median denticle; mandibles 3-dentate, without an inferior projection; cheeks narrower than eyes, simple below; vertex almost flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum equal

in length to pedicel, the following joints about twice this length (apical joints missing); front coxae thinly pubescent in front, with short tapering spines; front femora not distinctly keeled; front tarsi dilated, but not excavated anteriorly, the metatarsus but slightly longer than the second joint; mid tibia twice the length of the metatarsus, with an apical spur; abdomen short, apical margins of the segments but slightly depressed, if at all, except segment five; dorsal surface of segment six vertical in position, slightly protuberant medially, the carina low, roundly emarginate medially, produced into a short spine on each side of this emargination, teeth of the apical margin of the segment hardly evident; segment seven barely evident; four sternites exposed.

Puncturation: Rather fine in general; close on clypeus and vertex; densely crowded on face; shallow and quite distinctly separated on mesonotum and scutellum; distinctly separated on pleura; minute and close on abdomen basally, becoming very sparse and irregular on segment five which is polished; very fine and close on segment six which has scattered minute denticulations.

Color: Black; antennae brownish-ferruginous; mandibles and legs obscurely reddish, the tarsi becoming yellowish-ferruginous apically; front femora and tibiae more ferruginous, yellowish on the inner faces, front metatarsus yellowish-ferruginous, the following joints ivory; tegulae bronze-hyaline; wings slightly yellowish, the nervures ferruginous; spurs yellowish-ferruginous.

Pubescence: Long and ochraceous on head, thorax and basal segment of abdomen, more whitish on face with intermixed black hairs; fuscous on cheeks below; ochraceous on legs, but fuscous on outer faces of mid tarsi, with a fuscous posterior fringe; hind tarsi with fuscous fringes, the posterior fringes of the front tarsi mixed fuscous and whitish; segments two to five of abdomen with very broad ochraceous apical fasciae, that on segment five somewhat narrower, basal portions of these segments thinly black pubescent; segment six with a thin silvery pilosity and a few erect pale hairs.

Type.—Male; Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4150]. *Paratypes.*—1 ♂; topotypical. 1 ♂; Corumba, Brazil. 1 ♂; Uacarizal, Brazil, [all A. N. S. P.].

Megachile bella new species (Pls. X, XI and XII)

Male.—Size: Length, 11 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 8 mm.

Structure: Face longer than wide; eyes subparallel; apical margin of clypeus with a shallow median emargination which has a distinct median denticle; mandibles 3-dentate, without an

inferior projection; cheeks as broad as eyes, simple below; vertex flat, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the following joints about twice as long, the apical one not dilated; front coxae thinly pubescent anteriorly, with short flattened spines which are rounded apically; front femora not keeled; front tarsi slightly dilated, but not excavated, the metatarsus somewhat longer than the second joint; mid tibia longer than the metatarsus, with an apical spur; abdomen rather ovoid, apical margins of only the apical segments distinctly depressed; dorsal surface of segment six vertical in position, slightly protuberant medially near base, the carina quite conspicuous, triangularly pointed on each side of the semicircular median emargination, median and lateral teeth of the apical margin of the segment barely evident; segment seven evident, transversely carinate; four sternites exposed.

Puncturation: Rather coarse but quite close on vertex, mesonotum and pleura above; more widely separated on pleura below; somewhat finer and more sparse on scutellum; shallow and close on cheeks; coarse and close on clypeus except medially; very fine, quite close, and evenly distributed on abdomen, segment six almost rugoso-punctate but shining, especially the margin of the carina.

Color: Black; antennae ferruginous below, darker above; mandibles suffused with ferruginous toward apex; legs, tegulae, basal abdominal segment, and sternites of the other segments bright ferruginous; wings very faintly yellowish, the nervures brownish-ferruginous; spurs ferruginous.

Pubescence: Dense, fulvous and quite long on vertex and dorsum of thorax; more ochraceous on cheeks, pleura, propodeum, legs, and basal segment of abdomen; face and clypeus with rather long but decumbent ochraceous pubescence, more whitish between antennae, and numerous erect long black hairs below level of antennae; segments one to five of abdomen largely covered with dense yellow tomentum, but these with some short blackish pubescence across base, segment five with numerous short erect black hairs in addition to the tomentum, and segment six with only erect black hairs; sternites two and three fringed with white pubescence; posterior fringe of front tarsi rather short and thin, creamy-white without, more fuscous beneath; mid tarsi with very thin posterior ochraceous fringes; hind metatarsi fringed on both margins with blackish hairs, those on the apical joints ferruginous.

Type.—Male; Chapada, Brazil, May, (H. H. Smith), [A. N. S. P., no. 4135]. *Paratypes.*—23 ♂; topotypical, throughout the year, [A. N. S. P.].

Megachile trucis new species (Pls. X and XII)

Male.—Size: Length, 10 mm.; breadth of abdomen, 3.7 mm.; anterior wing, 7.5 mm.

Structure: Face about as long as broad; eyes subparallel; apical margin of clypeus with a rounded shallow median emargination having a median tubercle; mandibles 3-dentate, without an inferior projection; cheeks subequal to eyes in width; vertex flattened, hind margin nearly straight; lateral ocelli subequally distant from eyes and edge of vertex; first joint of flagellum subequal to pedicel, these two about equal to the second joint, the apical one neither dilated nor flattened; front coxae with short blunt spines; front tarsi slightly dilated, but considerably narrower than the tibiae, not at all excavated anteriorly; mid tibia with the usual apical spur; abdomen quite broad and considerably flattened, apical margins of the segments but slightly depressed, but segments two and three quite deeply grooved basally; carina of segment six prominent, with a deep rounded median emargination, the apical margin of the segment without evident teeth; segment seven not visible; four sternites exposed.

Puncturation: Fine and crowded on vertex and cheeks; more coarse and distinct on the shining clypeus; thorax shining, although closely and finely punctate on mesonotum and scutellum, more coarsely punctate on pleura; minute and very close on abdomen; segment six finely rugoso-punctate.

Color: Black, with generally dark legs, the apical tarsal joints yellowish-ferruginous; antennae and tegulae ferruginous, and abdominal sternites suffused with ferruginous; wings yellowish-hyaline, the nervures yellowish-ferruginous.

Pubescence: Whitish at sides of face and apical margin of clypeus; largely black on most of clypeus; black and ashy-white intermixed on cheeks and between antennae; long, dense and brownish-ferruginous on vertex and dorsum of thorax; whitish and less dense on thorax laterally and beneath; intermixed fuscous and whitish on legs, as also the front tarsal fringe, the hind metatarsi fringed on both margins with black hairs; abdominal segments largely covered with dense yellow tomentum; segment one with considerable long fuscous pubescence laterally, segments two and three with some black hairs across base, segment five with erect black hairs contrasting with the yellow tomentum, and segment six with scattered erect black hairs, entirely lacking yellow tomentum; sternites with white apical hair fringes.

Type.—Male; Villarrica, Paraguay, November 1923, [Meyer].

This bears a strong resemblance to *anthidioides* Radoszkowski as determined by Schrottky, in color of pubescence, and I had

determined it as that species before receiving the specimen of *anthidioides*. Structurally, however, the two are distinct.

Megachile expleta new species

Male.—Size: Length, 8 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face longer than wide; eyes slightly converging below; apical margin of clypeus with three small denticles medially; mandibles 3-dentate, without an inferior projection; cheeks as broad as eyes, simple below; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the following joints twice as long, the apical one not dilated; front coxae thinly pubescent anteriorly, with short flattened spines; front femora not keeled; front tarsi slightly dilated, but not excavated anteriorly; mid tibia twice as long as the metatarsus, with an apical spur; abdomen short and somewhat flattened, apical margin of segment five depressed laterally, the others not at all depressed; dorsal surface of segment six almost vertical in position, the carina conspicuous, with a deep rounded median emargination (much as in *bella*, Pl. XII), the apical margin of the segment without evident teeth; segment seven obtuse; four sternites exposed.

Puncturation: Relatively coarse on head and thorax; minute on abdomen; close but not densely crowded on vertex, cheeks, mesonotum, scutellum and pleura; rather widely separated on the shining and largely bare clypeus; densely crowded on face; very minute and quite close on the shining abdomen, coarser but shallow on segment six; tegulae almost impunctate; legs with relatively coarse sparse shallow punctures.

Color: Head and thorax black, the abdomen suffused with red; antennae ferruginous; legs obscurely reddish-fuscous, the tarsi more ferruginous; tegulae dull bronze-yellow to fuscous, changing at varying angles; wings yellowish, the nervures brownish-yellow; abdomen more ferruginous apically, blackish basally; spurs deep ferruginous.

Pubescence: Deep fulvous to fuscous on vertex and thorax above; face with intermixed black hairs; long and brownish-grey on cheeks below, with a fuscous patch just above this; more whitish on sternum; ochraceous on legs, with short inconspicuous black hairs; front tarsal fringe short, fuscous basally, paler on apical joints; mid tarsi with dense ochraceous pubescence on outer face, and a long thin ochraceous posterior fringe; hind tarsi fringed on both margins with blackish pubescence; abdomen

with short erect black hairs on segments five and six, and on sides of segments two to four, these latter apparently broadly covered apically with dense ochraceous or fulvous tomentum (specimen in poor condition), but this tomentum lacking on segments five and six.

Type.—Male; Tapyta, Paraguay, November 1925, [Meyer].

Megachile turpis new species (Pl. XII)

Male.—Size: Length, 12 mm.; breadth of abdomen, 5 mm.; anterior wing, 9 mm.

Structure: Face nearly square; eyes subparallel; apical margin of clypeus with a small median denticle; mandibles 3-dentate, without an inferior projection; cheeks slightly broader than eyes, simple below; vertex very slightly rounded, hind margin incurved; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum somewhat longer than pedicel, the following joints twice as long, the apical one not dilated; front coxae thinly pubescent anteriorly, with very short dentiform spines; front femora not distinctly keeled; front tarsi slightly dilated, the metatarsus not excavated anteriorly, rather short but considerably longer than joint two; mid tibia twice the length of the metatarsus, with an apical spur; abdomen short, broad and somewhat flattened, apical margins of the segments depressed laterally, scarcely at all medially; segment six largely hidden beneath segment five, slightly protuberant toward base medially, the carina conspicuous, with a large semicircular median emargination, the apical margin of the segment without evident teeth; segment seven inevident; four sternites exposed.

Puncturation: Close and rather fine on vertex; shallow and close on cheeks; coarse and definitely separated on clypeus, at least medially; distinctly separated on mesonotum medially, but close and fine anteriorly and laterally; distinctly separated on scutellum; deep and quite widely separated on pleura; very fine and quite close on abdomen, but segment six more coarsely rugoso-punctate; scattered and indistinct on tegulae.

Color: Black; antennae (including scape), tegulae, apical tarsal joints of all the legs, and abdominal sternites ferruginous; wings quite strongly yellowish, the nervures ferruginous; spurs pale ferruginous.

Pubescence: Pale ochraceous on apical margin of clypeus, on face above clypeus, and on vertex and dorsum of thorax; more whitish on cheeks, pleura, sternum, and legs; black and erect on clypeus and mandibles, the mandibles fringed below with long black hairs; cheeks below with a large patch of dense fuscous

pubescence just behind base of mandibles; discs of segments one to three of abdomen largely covered with short black pubescence, this rather long however on segment one, dark hairs on segment four subappressed and inconspicuous, and segments five and six with largely appressed silvery pubescence and long erect hairs, part of which are black, segment four also with considerable appressed pale pubescence basally; segments one to five with extremely narrow but entire white apical fasciae.

Type.—Male; Buenavista, Bolivia, [Meyer]. *Paratypes.*—3 ♂; topotypical, [Meyer].

One of the paratypes is abnormally small, being only 9 mm. in length.

Megachile futilis new species (Pl. XII)

Male.—Size: Length, 8 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 6 mm.

Structure: Face longer than broad; eyes converging below; apical margin of clypeus narrowly incurved medially; mandibles 3-dentate, without an inferior projection; cheeks about as broad as eyes, simple below; vertex rounded, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the following joints more than twice this length, the apical one not dilated; front coxae densely pubescent anteriorly, without spines; all the legs slender; front tarsi neither dilated nor excavated; mid tibia longer than the metatarsus, with an apical spur; abdominal segments slightly depressed on apical margins; segment six ventral in position, the carina quite conspicuous, roundly emarginate medially, apical margin of the segment without evident teeth; segment seven inevident; four sternites exposed, but the fourth extremely short, with only the apical margin visible.

Puncturation: Very fine and close throughout, being densely crowded on cheeks, vertex, mesonotum, scutellum and pleura above, somewhat more coarse and distinct on pleura below; very minute and crowded on abdomen; minute and scattered on tegulae; fine and close on legs.

Color: Quite uniformly black, but the antennae more fuscous beneath; front femora and tibiae yellowish-ferruginous on inner faces; tegulae fuscous; wings slightly infuscated, quite deeply so in region of radial cell, the nervures brownish-ferruginous; spurs reddish-yellow.

Pubescence: Whitish and dense on face, cheeks below, and sternum anteriorly; more ochraceous and thin on vertex and on thorax above and laterally; a line of black hairs across clypeus above, and some rather dense dark pubescence around tegulae and along metanotum and scutellum; short and rather dense pubescence, which appears blackish or pale ochraceous according to the angle at which it is seen, on segments one to four of abdomen, this more conspicuous laterally; segment six entirely covered, and segment five more thinly covered, with dense ochraceous tomentum, and evidences of a slight amount on segment four, segments four and five with inconspicuous apical fasciae, these evident on basal segments; apical segments without any black hairs; front tarsi without evident posterior fringes, but mid tarsi with long thin white posterior fringes.

Type.—Male; Tapyta, Paraguay, November 1925, [Meyer].

Megachile orba Schrottky

1913. *Megachile orba* Schrottky, Rev. Mus. Paulista, IX, p. 214.

Chapada, Brazil, March, (H. H. Smith), [A. N. S. P., 2 ♂]. Rio Frio, Magdalena, Colombia, February 1 and April 15, 1927, on *Machaerium humboldtiarum*, [Salt, 5 ♂].

The mandibles are much as in *aegra* (Pl. X).

Megachile turbulenta new species (Pl. XII)

Male.—Size: Length, 9 mm.; breadth of abdomen, 3 mm.; anterior wing, 8 mm.

Structure: Face longer than broad; eyes subparallel; apical margin of clypeus very slightly incurved medially, and with a very slight median tubercle; mandibles 3-dentate, without an inferior projection; cheeks slightly narrower than eyes, simple below, the hind margin carinate; vertex flat, hind margin almost straight; lateral ocelli much nearer eyes than to edge of vertex; antennae reaching beyond scutellum, basal joint of flagellum equal to pedicel in length, the following joints more than twice as long, the apical one not distinctly dilated; front coxae rather densely pubescent anteriorly, with short spines; front tarsi neither dilated nor excavated; mid tibia twice as long as the metatarsus, with an apical spur; hind legs slender; abdomen somewhat ovoid in shape, apical margins of the segments broadly but shallowly depressed, these depressions not evident on basal segments medially; segment six ventral in position, the carina rather inconspicuous, rounded on each side of a slight median emargination, apical margin of the segment without evident teeth; segment seven hardly evident; four sternites exposed.

Puncturation: Fine and close on cheeks; somewhat coarser and distinctly separated on vertex; fine and relatively sparse on the shining bare clypeus; rather fine and close on mesonotum, scutellum, and pleura above, much coarser and more sparse on pleura below; minute and very close on abdomen throughout, as also on tegulae.

Color: Black; antennae more piceous below; legs black except for the reddish inner faces of the front femora and tibiae; tegulae bronzy-piceous; wings subhyaline, but rather deeply infuscated in region of radial cell; nervures brownish to piceous; spurs ferruginous.

Pubescence: Dense and pale ochraceous at sides of face and lower margin of clypeus; more whitish on cheeks, pleura, propodeum and legs, long and dense on cheeks below; vertex and thorax above with intermixed short dark pubescence and longer pale hairs; segment one of abdomen with quite dense ochraceous pubescence above, discs of segments two to four with very short blackish pubescence, segments five to six, and base of segment four, covered with pale ochraceous tomentum, with scattered erect pale hairs, segment four also with an apical fascia of the same color, segments two to three subfasciate; sternites with dense apical whitish hair fringes; tarsal fringes very short and whitish.

Type.—Male; Buenavista, Bolivia, [Meyer]. *Paratype*.—1 ♂; topotypical, [Meyer].

Megachile ivonensis Cockerell

1927. *Megachile ivonensis* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, pp. 13 and 15.

Buenavista, Santa Cruz, Bolivia, [Meyer, 1 ♂].

The mandibles are much as in *aequalis* (Pl. X).

Megachile piurensis Cockerell

1911. *Megachile piurensis* Cockerell, Ann. Mag. Nat. Hist., (8), VIII, p. 288.
1912. *Megachile piurensis* Cockerell, Ann. Mag. Nat. Hist., (8), X, p. 487.
1917. *Megachile piurensis* Cockerell, Ann. Mag. Nat. Hist., (8), XX, p. 239.
1926. *Megachile piurensis* ♀ Cockerell, Ann. Mag. Nat. Hist., (9), XVII, p. 215.

Paita, Peru, August 28, (Cockerell), [M. C. Z., 1 ♀; det. Cockerell].

Megachile atromentata Cockerell

1917. *Megachile atromentata* Cockerell, Ann. Mag. Nat. Hist., (8), XX, p. 238.

Bahia Blanca, Argentina, [A. N. S. P., 1 ♀; det. Cockerell].

Megachile densa new species (Pl. XIV)

Female.—Size: Length, 13 mm.; breadth of abdomen, 5 mm.; anterior wing, 9 mm.

Structure: Face with length and breadth subequal; eyes parallel; apical margin of clypeus straight and entire medially; mandibles 4-dentate, the teeth rather obtuse, about equidistant from each other; cheeks subequal in width to eyes, but slightly narrowed above; vertex flat, hind margin slightly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; scutellum slightly protuberant medially; mid and hind metatarsi slightly narrower but distinctly shorter than their tibiae; claws with fine sharp basal teeth; abdomen broadly cordate, hind margins of the segments slightly depressed laterally, but not medially; segment six nearly straight laterally in dorsal aspect, as also in profile, with long suberect hairs visible in profile, the ventral plate quite uniformly pubescent, without a bare apical lip.

Puncturation: Very fine and close on cheeks and face, sparse medially on clypeus and supraclypeal area, and rather sparse on vertex laterally, closer medially; sparse on mesonotum in general, but a median area polished and impunctate; rather sparse also on scutellum medially, but close and fine laterally; close and fine on pleura throughout; fine and sparse on the shining abdomen except on segment six where the punctures are exceedingly minute and close.

Color: Black, including tegulae, legs and spurs; antennae obscurely ferruginous beneath; wings lightly and uniformly infuscated, the nervures fuscous.

Pubescence: Fuscous to black throughout, without pale fasciae, and with scopa entirely deep black, the pubescence very thin or largely lacking on dorsum of thorax and dorsal plates of abdomen.

Type.—Female; La Rioja, Argentina, [M. C. Z., no. 16205].

Megachile atricoma Vachal

1908. *Megachile atricoma* Vachal, Rev. d'Ent., xxvi, p. 224.
1920. *Megachile atricoma* Cockerell, Proc. U. S. Nat. Mus., lv, p. 219.
1927. *Megachile atricoma* Cockerell, Proc. U. S. Nat. Mus., lxxi, Art. 12, pp. 12 and 14.

Buenavista, Santa Cruz, Bolivia, [Meyer, 1 ♀]. British Guiana, June 28, 1901, (Crews), [Titus, 1 ♀].

Megachile pullata Smith (Pl. XIV)

1879. *Megachile pullata* Smith, Descr. N. Sp. Hymen. Brit. Mus., p. 74.
1913. *Megachile pullata* Schrottky, Rev. Mus. Paulista, ix, p. 182.

Santarem, Brazil, (H. H. Smith), [A. N. S. P., 1 ♀; compared with type (Waterston)].

Megachile conjugalis new species (Pl. XIV)

Female.—Size: Length, 13 mm.; breadth of abdomen, 5 mm.; anterior wing, 9.5 mm.

Structure: Length and breadth of face subequal; eyes parallel, clypeus slightly protuberant above, the apical margin straight; with three minute median tubercles; mandibles indistinctly 5-dentate, the two apical teeth robust, acute and approximate, the three inner ones very low and inconspicuous, approximate; cheeks below broader than eyes, slightly narrowed above; vertex flat, hind margin slightly incurved; lateral ocelli slightly nearer eyes than to edge of vertex; basal joint of flagellum subequal in length to pedicel, slightly shorter than the second joint; mid and hind metatarsi slightly narrower and considerably shorter than their tibiae; claws with sharp seta-like basal teeth; abdomen more ovoid, hind margins of the segments slightly depressed laterally, but not medially; segment six concave laterally in dorsal aspect, in profile straight with numerous erect hairs visible, the ventral plate quite uniformly pubescent, without a bare apical lip.

Puncturation: Very fine and close on cheeks, face, vertex, mesonotum, scutellum and pleura; becoming more coarse and distinctly separated on sternum and on supraclypeal area medially; rather coarse and sparse on the shining clypeus; minute and very close on segments one and two of abdomen, relatively coarse and sparse on segments three to five, which are shining, quite fine and close on segment six.

Color: Head and thorax black, the entire abdomen ferruginous; antennae ferruginous; tegulae pale ferruginous; wings faintly yellowish, violaceous apically, the nervures ferruginous; mid and hind femora suffused with red, legs otherwise black, and mandibles black, slightly suffused with red apically; spurs ferruginous.

Pubescence: Blackish on clypeus and face below antennae, on cheeks below, and on tibiae and tarsi in large part; whitish on sternum, and on femora and coxae; bright fulvous on pleura, propodeum, cheeks above, and basal segment of abdomen; deep fulvo-piceous on vertex, mesonotum and scutellum; discs of abdominal segments with scattered erect short black hairs, these longer and more dense laterally; segments one to four with white apical fasciae evident medially, but disappearing laterally; scopa pale ochraceous on segments two and three, entirely black on segments four to six and on segment three at extreme sides.

Type.—Female; Rio Branco, Amazonas, San Alberto, [August 27, 1924, [Meyer].

Megachile contemptus new species (Pl. XIV)

Female.—Size: Length, 11.5 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 9 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus denticulate; mandibles obscurely 5-dentate, the two apical teeth conspicuous, approximate, the three inner ones very low and inconspicuous; cheeks below as broad as eyes, slightly narrowed above; vertex very slightly convex, hind margin somewhat incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum very slightly longer than the pedicel, shorter than the second joint; mid metatarsi shorter than, but about as broad as, their tibiae, the hind metatarsi slightly shorter and narrower than their tibiae; claws with sharp basal teeth; abdomen broadly ovoid, apical margins of the segments somewhat depressed laterally; segment six slightly concave laterally in dorsal aspect, in profile slightly concave with numerous erect hairs visible, the ventral plate quite densely pubescent, without a bare apical lip.

Puncturation: Very fine and close on cheeks, vertex and face; more coarse and distinct on the shining clypeus and supraclypeal area; somewhat more coarse on mesonotum than on vertex, close laterally and anteriorly, but distinctly separated medially; relatively sparse on scutellum; quite close on pleura, coarser below; very fine and close on abdomen throughout.

Color: Black; antennae, mandibles, apical joints of tarsi, and tegulae ferruginous; wings yellowish, the nervures pale ferruginous; spurs deep ferruginous.

Pubescence: Fulvous on vertex and on dorsum of thorax laterally; pale ochraceous on disc of mesonotum, scutellum, and on basal segment of abdomen in part; more whitish on pleura, propodeum and legs; fulvous, with long intermixed fuscous hairs, on cheeks and clypeus; basal segment of abdomen with considerable long dark pubescence, that on discs of segments two and three short and black, silvery on segments four to six, longer on the two apical segments, and segment six with an appressed silvery pilosity in addition; segments two to five with extremely narrow whitish apical fasciae; scopa whitish on segments two to four, black on segments five and six, and on segments three and four laterally, that on segment six with some reddish hairs basally.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratypes.*—8 ♀; topotypical, [Meyer]. 1 ♀; Rio Frio, Magdalena, Colombia, November 27, 1926, (Salt).

Megachile reliqua new species (Pl. XIV)

Female.—Size: Length, 13 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 10 mm.

Structure: Face slightly broader than long; eyes subparallel; apical margin of clypeus slightly incurved, faintly crenulate laterally; mandibles 4-dentate, the teeth obtuse, cutting edges between the second, third and fourth; cheeks subequal to eyes in width, slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli considerably nearer edge of vertex than to eyes; basal joint of flagellum almost twice the length of the pedicel, subequal to the second joint, apical one slightly longer than the others; mid metatarsi very nearly as broad and as long as their tibiae, the hind metatarsi distinctly shorter and slightly narrower than their tibiae; claws with sharp basal teeth; abdomen ovoid, apical margins of the segments slightly depressed laterally; segment six nearly straight laterally in dorsal aspect, in profile also nearly straight and with numerous erect hairs visible, the ventral plate uniformly pubescent, without a bare apical lip.

Puncturation: Fine and rather close on vertex; closer on face and on clypeus laterally, distinctly separated on clypeus medially; shallow and rather sparse on the shining cheeks, more especially below; fine and close on anterior median portion of mesonotum, more coarse and sparse posteriorly and laterally; scutellum almost impunctate medially, sparsely and coarsely punctate laterally; deep, moderately coarse, and distinctly separated on pleura; fine and rather close on abdomen, very close on segment six.

Color: Black; antennae beneath, mandibles apically, extreme tips of tibiae, and apical tarsal joints rather obscurely ferruginous; tegulae yellowish-ferruginous; wings faintly yellowish, more clouded apically, the nervures ferruginous; spurs reddish.

Pubescence: Pale ochraceous on face, vertex, mesonotum, and scutellum; more greyish-white on cheeks, pleura, propodeum, legs and basal segment of abdomen; fulvous patches above and in front of tegulae, and fulvous on outer faces of front and mid metatarsi, and in part on vertex; mixed blackish and pale on clypeus; short, thin and whitish on discs of abdominal segments, with some longer fulvous hairs on segment five, segments one to five with entire whitish apical fasciae, segment six with entirely whitish pubescence which is partly erect and partly appressed; fifth sternite with an entire dense white apical fascia beneath the scopa, the other sternites subfasciate laterally; scopa whitish basally, more fulvous on segments three to six, with black hairs intermixed on segments three and four laterally and entirely across segment four apically.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratype.*—1 ♀; topotypical, [Meyer].

Megachile diversa new species

Female.—Size: Length, 12 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 9 mm.

Structure: Face longer than broad; eyes subparallel; apical margin of clypeus denticulate medially (much as in *conjugalis*, Pl. XIV); mandibles inconspicuously 5-dentate (also see *conjugalis*), the teeth rather acute; cheeks below as broad as eyes, slightly narrowed above; vertex very slightly convex, hind margin strongly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; joints one and two of flagellum subequal, slightly longer than the pedicel, shorter than joint three; mid and hind metatarsi only slightly shorter and narrower than the respective tibiae; mid tarsal joints fringed beneath apically with reddish bristles; claws with sharp slender basal teeth; abdomen cordate, apical margins of the segments not depressed; segment six very slightly concave laterally in dorsal aspect, in profile practically straight, with numerous erect hairs visible, the ventral plate quite uniformly pubescent, without a bare apical lip.

Puncturation: Very close and fine on vertex, face and cheeks; somewhat coarser but close on clypeus and supraclypeal area; moderately coarse on mesonotum and scutellum where they are close laterally but distinctly separated medially; more coarse and deep, and distinctly separated on pleura; very minute and quite close on abdomen, the surface of which is shining where not covered by dense tomentum.

Color: Black; antennae, mandibles, legs, tegulae, and basal segment of abdomen clear ferruginous, the teeth of the mandibles blackened, and the hind metatarsi blackish on posterior margin; abdominal sternites suffused with ferruginous; wings pale yellowish, the nervures yellowish-ferruginous; spurs ferruginous.

Pubescence: Dense and fulvous on vertex and thorax above; more ochraceous on cheeks, pleura, propodeum, legs and basal segment of abdomen; intermixed short subappressed pale ochraceous pubescence and longer erect blackish hairs on face and clypeus; basal portions of discs of segments two to five with short black pubescence, contrasting sharply with the dense yellow tomentum which covers the apical three-fourths of each disc; segment six with erect black hairs and thin, subappressed silvery pilosity; scopa whitish-ochraceous on segments two to four, black on segments five and six, as also on segment four laterally.

Type.—Female; Chapada, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4127].

Megachile vestis new species

Female.—Size: Length, 12 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 8.5 mm.

Structure: Face longer than broad; eyes slightly converging below; apical margin of clypeus minutely denticulate medially; mandibles inconspicuously 5-dentate (as in *conjugalis*, Pl. XIV), all of the teeth acute; cheeks very slightly narrower than eyes, not much narrowed above; vertex very slightly convex, hind margin almost straight; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to the second joint, slightly longer than the pedicel; mid and hind metatarsi somewhat shorter and narrower than the respective tibiae, the other tarsal joints fringed beneath apically with orange bristles; claws with sharp basal teeth; abdomen cordate, apical margins of the segments not appreciably depressed; segment six slightly concave laterally in dorsal aspect, in profile straight with numerous visible erect hairs, the ventral plate densely pubescent, without a bare apical lip.

Puncturation: Fine and densely crowded on entire head; more coarse on thorax, crowded on mesonotum and scutellum, close but distinct on pleura; fine and rather close on the shining abdomen, minute and dense on segment six.

Color: Black; antennae, mandibles, legs, tegulae, and basal abdominal segment clear ferruginous, teeth of the mandibles blackened, the second abdominal segment suffused with ferruginous beneath; wings faintly yellowish, more so in region of radial cell, nervures pale ferruginous; spurs ferruginous.

Pubescence: Fulvous on vertex; pale ochraceous on cheeks; silvery, with intermixed long black hairs on face and clypeus; very dense and ochraceous on mesonotum and scutellum, more fulvous around prothoracic tubercles; pale ochraceous on pleura, propodeum, legs, and basal segment of abdomen; short and black on discs of segments two to four, segments one to five with dense yellow apical fasciae which cover about the apical third of the discs, segment five largely covered with yellow tomentum, with numerous erect black hairs, and segment six with erect black hairs and a very fine silvery pruinosity, fifth sternite with a white apical fascia which is narrowly interrupted medially; scopa whitish on segments two and three and on segment four basally, black on segments five and six and on segment four apically.

Type.—Female; Chapada, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4128].

Megachile melanopoda Cockerell (?)

1923. *Megachile melanopoda* Cockerell, Ann. Mag. Nat. Hist., (9), XI, p. 456.

Chapada, Brazil, January, (H. H. Smith), [A. N. S. P., 1 ♂].

This species is queried, since the type has not been seen, and there are certain minor disagreements with the description. According to the description, this species has black tarsi, apparently contrasting with the ferruginous femora and tibiae, dark reddish tegulae, and the front coxae are shining. In the specimen recorded here the tegulae are more yellowish-ferruginous, the tarsi are more reddish, yet darker than the femora and tibiae, and the anterior coxae are quite densely pubescent. In other respects it agrees with the description.

Megachile philinca var. a, Cockerell

1912. *Megachile philinca* Cockerell, The Entomol., XLV, p. 176.

1914. *Megachile philinca* var. a, Cockerell, J. N. Y. Ent. Soc., XXII, p. 310.

Guayaquil, Ecuador, May–June 1913, (Brues), [M. C. Z., 1 ♂; det. Cockerell].

The mandibles in this species are much as in *trucis* (Pl. X), while the carina of segment six is quite similar to *antiqua* (Pl. XII).

Megachile anodonta Cockerell (Pl. XIV)

1927. *Megachile anodonta* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, pp. 13 and 18.

Benque Viejo, British Honduras, (Stanton), [M. C. Z., 2 ♂, 3 ♀]. Belize, Honduras, [M. C. Z., 2 ♀; compared with type].

Megachile semota Cockerell

1927. *Megachile semota* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, pp. 13 and 22.

Chapada, Santarem and Pedra Branca, Brazil, September–April, (H. H. Smith), [A. N. S. P., 10 ♂; compared with type].

The mandibles are much as in *aequalis* (Pl. X), while the carina of segment six resembles that in *abnormis* (Pl. XII).

Megachile cara new species (Pl. XII)

Male.—Size: Length, 5.5 mm.; breadth of abdomen, 2 mm.; anterior wing, 5 mm.

Structure: Face longer than wide; eyes converging below; apical margin of clypeus with a very slight median emargination; mandibles 3-dentate, without an inferior projection; cheeks

subequal in width to eyes, the posterior margin carinate, simple below; vertex rounded, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum barely as long as the pedicel, the following joints twice this length, the apical one not dilated, attaining the apical margin of the basal abdominal segment; front coxae quite densely pubescent, not spined; front legs very slender, as also the tarsi which are not at all excavated anteriorly; mid and hind legs also slender, mid tibia with a short apical spur; abdomen short and quite strongly flexed, apical margins of the segments slightly and very narrowly depressed; segment six ventral in position, with a barely evident carina which has a very slight median emargination, the apical margin of the segment with barely evident carinate median teeth, the lateral teeth inevident; the obtuse tip of segment seven just evident; only three sternites exposed.

Puncturation: Quite fine and close on face, vertex, mesonotum and dorsal abdominal plates; more coarse and sparse on pleura, especially below; close and rather coarse on clypeus; cheeks rugoso-punctate.

Color: Black; antennae more fuscous below; apical leg joints more ferruginous; tegulae shining fuscous; wings subhyaline basally, more deeply infuscated apically, quite deeply so in region of radial cell, violaceous, the nervures fuscous; spurs ferruginous.

Pubescence: Moderately long and cream-color on face, vertex, and thorax; dense and white on cheeks below; very short, inconspicuous and black on discs of segments one to four, segments three to five with entire whitish apical fasciae, segment five with considerable whitish tomentum basally, with short erect pale hairs, segment six largely covered with white tomentum; tarsi without fringes except for a few long posterior hairs on the front tarsi.

Type.—Male; Buenavista, Bolivia, [Meyer]. *Paratypes.*—2 ♂; topotypical, [Meyer].

Megachile mobilis new species (Pl. XII)

Male.—Size: Length, 6 mm.; breadth of abdomen, 2 mm.; anterior wing, 5 mm.

Structure: Face almost as wide above as long; eyes converging below; apical margin of clypeus denticulate beneath the short apical beard; mandibles 3-dentate, without an inferior projection; cheeks narrower than eyes, strongly carinate on hind margin, simple below; vertex slightly rounded, hind margin carinate, straight; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel,

the following joints about twice as long as broad, the apical one not dilated; front coxae thinly pubescent anteriorly, without spines or tubercles; front legs slender, the tarsi neither dilated nor excavated; mid and hind legs slender and simple; abdomen flattened, short and broad, apical margins of the segments only slightly depressed at the sides; dorsal surface of segment six vertical in position, the carina consisting of two short, triangularly pointed, shining teeth separated by a deep rounded emargination, the apical margin of the segment with low carinate median teeth but no evident lateral teeth; segment seven slightly pointed medially, barely evident; four sternites exposed.

Puncturation: Fine and close in general; scattered and sparse on the polished bare clypeus, but closer laterally; fine and densely crowded between clypeus and ocelli, coarser and more distinctly separated on vertex; fine and close on mesonotum and scutellum; coarser and more sparse on pleura; minute and close on lateral faces of propodeum, sparse on posterior face; very fine and close on abdomen throughout.

Color: Black, including tegulae and legs; antennae obscurely brownish-fuscous beneath; wings slightly infuscated, quite deeply so in region of radial cell, the nervures fuscous; spurs fuscous.

Pubescence: Short, thin and inconspicuous; white and rather dense on cheeks below and on sternum; clypeus with only a short apical ochraceous fringe; blackish between and around antennae, around tegulae, on scutellum and metanotum, whitish on propodeum; with scattered erect dark hairs on vertex and mesonotum, and an inconspicuous ochraceous pilosity, visible only at certain angles; very short and pale on legs; short and inconspicuous on abdomen, more ochraceous on segment one, blackish on discs of median segments, pale and mostly erect on segment six, segment five with an entire pale ochraceous apical fascia, and a similar but thinner one on segment four, none of the apical segments with dense tomentum.

Type.—Male; Buenavista, Bolivia, [Meyer].

All the close relatives of this species are densely pale tomentose on segment six, and therefore this one is easily distinguished from the others. Of these, *M. bertonii* Schrottky is probably the nearest affinity, and that differs in having both segments five and six densely tomentose. In both *M. microdontura* Cockerell and *M. leucostomella* Cockerell, the teeth of the transverse carina of segment six are less widely separated, with their bases contiguous, and segment six is densely tomentose; and in *microdontura* the clypeus is more closely punctate also.

Megachile microdontura Cockerell

1927. *Megachile microdontura* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12 pp. 13 and 19.

Chapada, Brazil, November, January and March, (H. H. Smith), [A. N. S. P., 14 ♂; compared with type].

Megachile leucostomella Cockerell

1927. *Megachile leucostomella* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, pp. 13 and 20.

Buenavista, Santa Cruz, Bolivia, [Meyer, 1 ♂].

Megachile bertonii Schrottky

1908. *Megachile bertonii* Schrottky, Anal. Soc. Cien. Argentina, LXV, p. 235.
1913. *Megachile bertonii* Schrottky, Rev. Mus. Paulista, IX, p. 198.
1922. *Megachile bertonii* Cockerell, Ann. Mag. Nat. Hist., (9), IX, p. 366.

Chapada, Brazil, September–March, (H. H. Smith), [A. N. S. P., 20 ♀, 10 ♂]. Buenavista, Santa Cruz, Bolivia, [Meyer, 1 ♂].

The carina of segment six in the male is similar to *acerba* (Pl. XII).

Megachile pilosa Smith

1879. *Megachile pilosa* Smith, Descr. N. Sp. Hymen. Brit. Mus., p. 77.
1913. *Megachile pilosa* Schrottky, Rev. Mus. Paulista, IX, p. 160.

Chapada, Brazil, October, November, January, (H. H. Smith), [A. N. S. P., 3 ♀]. Buenavista, Santa Cruz, Bolivia, [Meyer, 1 ♀].

Megachile microsoma Cockerell

1912. *Megachile microsoma* Cockerell, Psyche, XIX, p. 55.
1922. *Megachile microsoma* Cockerell, Ann. Mag. Nat. Hist., (9), IX, p. 366.
1927. *Megachile microsoma* Cockerell, Proc. U. S. Nat. Mus., LXXI, Art. 12, pp. 13 and 14.

Chapada, Santarem and Maram, Brazil, (H. H. Smith), [A. N. S. P., 3 ♀]. British Guiana, [Titus, 1 ♀]. Locality unknown (Crew), [Titus, 1 ♀].

Megachile acerba new species (Pl. XII)

Male.—Size: Length, 8 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face longer than broad; eyes converging below; apical margin of clypeus slightly incurved medially, with a minute median denticle; cheeks slightly narrower than eyes, the posterior margin carinate, simple below; vertex rounded, hind

margin evenly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the following joints not quite twice as long as broad (apical one missing); front coxae thinly pubescent anteriorly, with very slight tubercles but no distinct spines; all the legs slender and simple; front tarsi neither dilated nor excavated; mid tibia longer than the metatarsus, with an apical spur; abdomen short, broad and flat, apical margins of the segments only very slightly and narrowly depressed; dorsal surface of segment six vertical, the carina consisting of two short shining triangularly pointed protuberances, the apical margin of the segment without evident teeth; segment seven evident, obtuse; four sternites exposed.

Puncturation: Fine and close on cheeks and vertex; scattered in center of shining clypeus; dense and fine in center of mesonotum, becoming coarse and relatively sparse laterally; rather coarse on pleura, somewhat sparse medially; very minute and close on abdomen throughout.

Color: Black; antennae and tegulae more fuscous, the legs obscurely reddish; wings yellowish, more deeply so along costa and in region of radial cell, the nervures brownish; spurs dark ferruginous.

Pubescence: Very short throughout; ochraceous at sides of face, and clypeus with a short ochraceous apical fringe; blackish below and between antennae, with ochraceous pubescence above and below level of antennae; pale and appressed on cheeks, but long and white below; short pale and appressed on vertex and mesonotum, blackish on margins of mesonotum and along scutellum and metanotum; short and pale on pleura and sternum, more dense below; short and pale on legs, but fuscous on outer face of mid tarsus; entirely pale on abdomen, but very short and inconspicuous on segments one to three and basal portion of segment four, segments five and six entirely covered with dense yellow tomentum, as also the apical half of segment four, none of the basal segments fasciate, but sternites two to four with dense yellow apical fasciae.

Type.—Male; Chapada, Brazil, December, (H. H. Smith), [A. N. S. P., no. 4123]. *Paratypes.*—2 ♂; topotypical, December and March, [A. N. S. P.].

This is possibly the male of *M. pilosa* Smith, which it resembles in size and arrangement of pubescence.

Megachile ardua new species (Pl. XII)

Male.—Size: Length, 6 mm.; breadth of abdomen, 2 mm.; anterior wing, 6 mm.

Structure: Face about as broad as long; eyes converging below; mandibles 3-dentate, without an inferior projection; cheeks slightly narrower than eyes, simple below, not carinate; vertex slightly rounded, hind margin slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the following joints about twice as long (apical one missing); front coxae densely pubescent anteriorly, with neither spines nor tubercles; front tarsi slender, neither dilated nor excavated; mid tibia longer than the metatarsus, with an apical spur; hind legs slender; abdomen somewhat ovoid, apical margins of the segments distinctly depressed laterally; dorsal surface of segment six vertical in position, very slightly protuberant medially at base, the carina rather conspicuous, obtusely triangular on each side of the semicircular median emargination, the median carinate teeth of the apical margin of the segment more distant from each other than from the acute lateral teeth; segment seven barely evident, slightly pointed medially; four sternites exposed.

Puncturation: Very close and fine throughout; densely crowded on thorax above; somewhat coarser on pleura; minute and crowded on abdomen; very close but more distinct on vertex.

Color: Black; antennae brownish-ferruginous beneath; legs deep ferruginous; tegulae yellowish-ferruginous; wings slightly infuscated apically, becoming more yellowish basally, the nervures yellowish-ferruginous; spurs pale yellow.

Pubescence: Dense and whitish on clypeus, face below antennae, cheeks below, and around front coxae, with a row of black hairs on clypeus above; short, thin and more ochraceous on vertex and mesonotum; more whitish on pleura; fuscous on lateral margins of mesonotum, on scutellum, and on discs of segments two and three of abdomen; segments four to six with dense yellow tomentum and with rather short erect yellow hairs in addition; front tarsal fringes very short, the mid tarsal fringes relatively long, faintly brownish; sternites two and three with pale yellow apical fasciae.

Type.—Male; Chapada, Brazil, (H. H. Smith), [A. N. S. P., no. 4124]. *Paratypes.*—1 ♂; topotypical, [A. N. S. P.]. 5 ♂; Buenavista, Bolivia. 5 ♂; Tapyta, Paraguay, November 1925. 1 ♂; Villarrica, Paraguay, November 1923, [all Meyer].

Megachile donata new species (Pl. XII)

Male.—Size: Length, 11 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 8 mm.

Structure: Face broader than long; eyes converging below; apical margin of clypeus incurved medially; mandibles 3-dentate, without an inferior projection; cheeks slightly narrower than eyes, simple below; vertex flat, hind margin slightly incurved; lateral ocelli somewhat nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the following joints twice as long, the apical one not dilated, reaching beyond the scutellum; front coxae thinly pubescent anteriorly, without spines or tubercles; front legs slender, the tarsi neither dilated nor excavated; mid tibia twice as long as the metatarsus, with an apical spur; hind legs relatively slender; abdomen somewhat ovoid, apical margins of the segments slightly depressed laterally; segment six ventral in position, with a rather pronounced median protuberance above the carina which is low but evident, with a small median emargination, apical margin of the segment without evident teeth; segment seven inevident; four sternites exposed.

Puncturation: Rather coarse and close on mesonotum; somewhat more sparse on scutellum and vertex; coarse and densely crowded on pleura; fine and close on cheeks; close on clypeus laterally, relatively sparse medially; very fine and close on abdomen throughout; tegulae practically impunctate.

Color: Black; antennae reddish-fuscous below; legs more or less suffused with dark red basally, more blackish apically; tegulae and spurs yellowish-ferruginous; wings faintly infuscated, the nervures fuscous to ferruginous.

Pubescence: Pale ochraceous and quite dense on face, intermixed with black laterally and on lateral margins of clypeus; more whitish on cheeks, pleura, sternum, propodeum, and legs, long and dense on cheeks below; dense and pale ochraceous around wing bases, with a blackish patch just below tegulae; black between antennae, on vertex, and in large part on mesonotum and scutellum, longer on vertex and scutellum; long and intermixed black and pale on basal segment of abdomen, shorter and black on segment two, very short and black on segments three and four, segments five and six with appressed whitish tomentum and longer erect black hairs; segments two to five with narrow indistinct white apical fasciae; sternites one to three with rather dense white apical fasciae.

Type.—Male; Chapada, Brazil, January, (H. H. Smith), [A. N. S. P., no. 4129]. *Paratypes.*—2 ♂; topotypical, December and January, [A. N. S. P.].

Megachile antiqua new species (Pls. X and XII)

Male.—Size: Length, 8 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face about as broad above as long; eyes quite strongly converging below; apical margin of clypeus narrowly incurved medially; mandibles 3-dentate, without an inferior projection; cheeks as broad as eyes, simple below; vertex flat, hind margin incurved; lateral ocelli somewhat nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the following joints three times this length, apical one not dilated; front coxae quite densely pubescent anteriorly, without spines; front legs entirely simple, the tarsi narrow, not at all excavated; mid tibia considerably longer than the narrow metatarsus, with an apical spur; hind tarsi narrow; abdomen short and broad, apical margins of the segments but very slightly depressed laterally; segment six ventral in position, protuberant medially toward the base, the carina almost inevident, consisting of a pair of slight carinate protuberances, one on each side of middle, apical margin of the segment without evident teeth; apical margin of segment seven barely evident; four sternites exposed, the first much enlarged, reaching the apical margin of the second, much thickened apically, the incurved thickened margin densely pubescent.

Puncturation: Close but rather coarse in general, especially on face, vertex, mesonotum, scutellum and pleura; relatively fine, shallow and sparse on cheeks; close on abdomen, very fine and indistinct on basal segment, becoming quite coarse and deep on segment four, very close and fine on segments five and six; fine and close on tegulae; rather coarse, shallow and sparse on legs.

Color: Black; antennae and legs more piceous; tegulae bronzy-piceous; wings subhyaline, the nervures brownish-fuscous; spurs yellowish-brown.

Pubescence: Dense and entirely ochraceous on face and clypeus; whitish on cheeks, pleura, sternum and legs; short and greyish, with longer erect black hairs on vertex, mesonotum and scutellum, the black hairs more conspicuous on scutellum; long and whitish on basal segment of abdomen, short and black on discs of segments two to four, segments five and six with rather thin whitish tomentum and longer erect black hairs; segments two to five with narrow, entire, whitish apical fasciae; sternites two to four with narrow white apical fasciae, the thickened margin of sternite one with dense ochraceous pubescence.

Type.—Male; Chapada, Brazil, January, (H. H. Smith), [A. N. S. P., no. 4121]. *Paratypes.*—3 ♂; topotypical, December and January, [A. N. S. P.].

Megachile abnormis new species (Pl. XII)

Male.—Size: Length, 8.5 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face slightly broader above than it is long; eyes converging below; apical margin of clypeus slightly incurved medially; mandibles 3-dentate, without an inferior projection; cheeks hardly as broad as eyes, simple below, hind margin slightly carinate; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum equal to pedicel in length, the following joints slightly more than twice as long, apical one not dilated, reaching beyond the scutellum; front coxae pubescent anteriorly, with neither spines nor tubercles; front legs slender, the tarsi neither dilated nor excavated; mid tibia longer than the metatarsus, with an apical spur; hind legs very slender; abdomen somewhat ovoid, apical margins of the segments depressed laterally; dorsal surface of segment six vertical in position, slightly protuberant medially, the carina very low and inconspicuous, not emarginate, apical margin of the segment without evident teeth; segment seven barely evident; four sternites exposed.

Puncturation: Rather coarse and close on mesonotum and scutellum; coarse and sparse on pleura; somewhat finer and separated on vertex; minute and quite close on cheeks; close and fine on basal abdominal segments, becoming somewhat coarse and more distinctly separated on segment four, segment five somewhat rugosely punctate, and segment six very finely rugosopunctate.

Color: Black; antennae more piceous; tegulae deep bronzy-ferruginous; wings lightly infuscated, somewhat more deeply so apically and in radial cell, the nervures piceous; spurs pale yellow.

Pubescence: Dense pale ochraceous on face and clypeus; more whitish just above and between antennae, on cheeks, pleura below, propodeum, basal segments of abdomen, around pronotal tubercles, and behind wing bases; long, erect and blackish on vertex, mesonotum and scutellum, with a rather large black patch on pleura above; short and blackish on discs of segments two to four, segments five and six with thin whitish tomentum and rather short erect black hairs; segments two to five subfasciate at sides; tarsal fringes very short and yellowish.

Type.—Male; Tapyta, Paraguay, November 1928, [Meyer]. *Paratypes.*—2 ♂; topotypical. 2 ♂; Abai, Paraguay, November 1925. 1 ♂; Buenavista, Bolivia, [all Meyer].

Megachile certa new species (Pl. XII)

Male.—Size: Length, 8 mm.; breadth of abdomen, 2.6 mm.; anterior wing, 6 mm.

Structure: Face slightly broader above than long; eyes converging below; apical margin of clypeus very slightly incurved medially; mandibles 3-dentate, without an inferior projection; cheeks subequal to eyes in width, simple below, the posterior margin sharp but not carinate; vertex flat, hind margin very slightly incurved; lateral ocelli nearer to edge of vertex than to eyes; basal joint of flagellum about equal to pedicel in length, the following joints about three times as long, apical one not dilated; front coxae densely pubescent, without spines or tubercles; front legs very slender, the tarsi neither dilated nor excavated; mid and hind legs slender, the mid tibia longer than the metatarsus, with an apical spur; abdomen short and rather broad, slightly tapering posteriorly, apical margins of the segments hardly at all depressed; segment six ventral in position, the transverse carina very slightly produced, narrow, subentire, apical margin of the segment without evident teeth; segment seven inevident; four sternites exposed, the short thickened apical margin of the first with dense yellowish pubescence, the fourth very short, with only the apical margin exposed.

Puncturation: Fine and shallow on cheeks; much coarser on vertex where the punctures are close but irregularly spaced; coarse and close on pleura; fine and close on scutellum; mesonotum rather indistinctly striately rugoso-punctate; fine and close on abdomen throughout; tegulae almost impunctate.

Color: Black; antennae dark reddish beneath; legs more or less suffused with dark red, especially the hind pair; tegulae bronzy-ferruginous; wings subhyaline, the nervures ferruginous to piceous; spurs yellowish-ferruginous.

Pubescence: Dense and pale ochraceous on face, intermixed with black at sides, also dense and pale ochraceous around wing bases; more whitish on cheeks, pleura, legs, and basal segment of abdomen, long and dense on cheeks below, a rather large black patch on each pleuron above; long, erect and black on vertex, mesonotum and scutellum; short and black on discs of segments two to four of abdomen, segments five and six with pale appressed tomentum and long erect black hairs; segments two to five with indistinct pale apical fasciae; sternites two to four with white apical fasciae, that on the fourth interrupted medially, the first with dense yellow pubescence on the thickened apical margin.

Type.—Male; Chapada, Brazil, January, (H. H. Smith), [A. N. S. P., no. 4120]. *Paratypes.*—43 ♂; topotypical, September to January and March, [A. N. S. P.]. 7 ♂; Buenavista, Bolivia, [Meyer].

Megachile fiebrigi Schrottky

1908. *Megachile fiebrigi* Schrottky, Anal. Soc. Cien. Argentina, LXV, p. 234.
1909. *Megachile planiceps* Friese, D. Ent. Zeitschr., 1909, p. 236.
1913. *Megachile fiebrigi* Schrottky, Rev. Mus. Paulista, IX, p. 154.
1920. *Megachile fiebrigi* Schrottky, Rev. Mus. Paulista, XII, p. 208.

Chapada, Brazil, September, (H. H. Smith), [A. N. S. P., 1 ♀].

The clypeus and mandibles are of the *orbiculata-habilis* type (Pl. XIV).

Megachile orbiculata new species (Pl. XIV)

Female.—Size: Length, 11.5 mm.; breadth of abdomen, 4 mm.; anterior wing, 9.5 mm.

Structure: Face about as broad as long; eyes subparallel; clypeus produced medially, the elevated portion flattened with its apical margin incurved; mandibles 4-dentate, the two apical teeth approximate, the inner tooth narrowly truncate; cheeks narrower than eyes, narrowed above, hind margin sharply carinate; vertex very slightly convex, hind margin incurved, with a sharp but not carinate edge; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum slightly shorter than the pedicel, the second slightly longer than the pedicel; scutellum slightly protuberant medially; mid and hind metatarsi slightly shorter and narrower than their tibiae; claws with sharp basal teeth; abdomen ovoid-cordate, hind margins of the segments distinctly and rather broadly depressed at extreme sides, not at all medially; segment six slightly concave laterally in dorsal aspect, in profile very slightly concave, with no visible erect hairs, the ventral plate largely bare, without a bare apical lip.

Puncturation: Very fine and close on cheeks and sides of face; fine and rather sparse on supraclypeal area; sparse and irregular as to size on clypeus, which is largely impunctate but dull medially; very coarse, deep and sparse between antennae and ocelli, and on vertex laterally, finer and closer on vertex medially; very coarse, deep and sparse on the shining mesonotum and pleura; upper face of scutellum polished and impunctate, posterior face with very minute punctures; fine and rather close on abdomen, extremely close on segment six, the areas just in front of the lateral depressions on each segment largely impunctate.

Color: Black; antennae dull brownish-ferruginous beneath; tegulae clear ferruginous; wings pale yellowish, slightly darker along costal margin of radial cell, the nervures ferruginous; spurs yellowish-ferruginous.

Pubescence: Very thin laterally and practically lacking on the dorsal surfaces; whitish or pale ochraceous on cheeks, pleura, propodeum and legs; mixed whitish and black on face; black on vertex, dorsum of thorax and discs of abdominal segments which are without any traces of fasciae, segment six with fine appressed tomentum which is greyish laterally and basally, more brownish medially and apically; short and blackish on outer faces of front tibiae; fulvous on outer faces of front and middle metatarsi, the hind tarsi with black hairs along the posterior margin; scopa white, mostly black on segment five, black laterally on segments three and four, and black in part on segment six.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratypes.*—3 ♀; topotypical, [Meyer]. 2 ♀; Chapada, Brazil, November, (H. H. Smith), [A. N. S. P.].

This is very close to *M. fiebrigi* Schrottky, but the latter differs in having dark tegulae, and in having but a few black hairs in the scopa on segment six apically, the scopa on the other segments being entirely pale.

Megachile corona new species

Female.—Size: Length, 13 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 8.5 mm.

Structure: Face broader than long; eyes converging below; clypeus protuberant medially (as in *orbiculata*, Pl. XIV), the apical margin of the elevated portion incurved and considerably thickened; mandibles 4-dentate (much as in *orbiculata*), the two apical teeth approximate, the inner one subtruncate, a short cutting edge between the third and fourth; cheeks below as broad as eyes, slightly narrower above, hind margin subcarinate; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum subequal to pedicel in length, the second joint longer; mid and hind metatarsi subequal in width to their tibiae, but slightly shorter; claws with minute basal teeth; abdomen cordate, hind margins of the segments depressed laterally, but not in the broad median area; segment six very slightly concave laterally in dorsal aspect, in profile straight with scattered suberect hairs visible basally, the ventral plate largely bare on apical half, with a very narrow indistinct bare apical lip.

Puncturation: Very fine and close on cheeks and on face laterally, more coarse on face medially; scattered and rather coarse on vertex laterally, fine and closer medially; widely scattered and irregular on clypeus medially, closer laterally; supraclypeal area largely impunctate; thorax largely rugosopunctate, striately so on pleura in part, finely so on mesonotum, scutellum and pleura above, more coarse on pleura below; fine and quite close on abdomen throughout.

Color: Black; antennae more dark reddish beneath; tegulae and spurs ferruginous; wings uniformly lightly infuscated, the nervures fuscous.

Pubescence: Whitish on cheeks, pleura and sternum; more ochraceous on propodeum, legs and basal segment of abdomen; dense fulvo-ochraceous tufts around pronotal tubercles and behind wing bases; mostly black on face and vertex, but with short whitish pubescence on face laterally and between antennae; mixed black and fulvo-ochraceous on mesonotum and scutellum; short and black on discs of abdominal segments two to five, and these with entire ochraceous apical fasciae; segment six with ochraceous appressed tomentum and scattered erect black hairs toward base; scopa fulvo-ochraceous medially, black laterally on all except segment two.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratype.*—1 ♀; topotypical, [Meyer].

Megachile insolens new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 3.7 mm.; anterior wing, 7 mm.

Structure: Face slightly broader above than long; eyes slightly converging below; clypeus slightly protuberant medially (somewhat similar to *orbiculata*, Pl. XIV), the apical margin of the elevated area incurved and slightly crenulated; mandibles 4-dentate (as in *orbiculata*), the two apical teeth approximate, the other two rather distant, low and inconspicuous; cheeks below subequal in width to eyes, narrower above, hind margin slightly carinate; vertex flat, hind margin incurved; lateral ocelli nearer to edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the second joint almost twice as long; mid and hind metatarsi fully as broad as their tibiae, but definitely shorter; claws with extremely minute basal teeth; abdomen cordate, hind margins of the segments slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with only scattered erect hairs visible toward the base, the ventral plate bare and shining on apical half, but without a bare apical lip.

Puncturation: Very fine and rather close on the shining cheeks; coarser but close on vertex medially, more sparse laterally; clypeus and supraclypeal area largely impunctate, with but a very few scattered punctures medially, but more closely punctate at extreme sides; mesonotum rugoso-punctate, somewhat striately so anteriorly, the scutellum with fine and close punctures; pleura more coarsely and striately rugoso-punctate; abdomen quite closely and finely punctate throughout.

Color: Black; antennae obscurely reddish below; tegulae and spurs pale yellowish-ferruginous; wings subhyaline, but very slightly clouded apically, the nervures fuscous; abdomen with purplish reflections.

Pubescence: Whitish on cheeks below, pleura, sternum, propodeum laterally and legs, these becoming more ochraceous above; fulvo-ochraceous around wing bases, behind scutellum, on propodeum, and basal segment of abdomen; mixed pale ochraceous and black on face; mesonotum and scutellum with erect black and shorter subappressed ochraceous pubescence; long and black on vertex; very short and black on discs of segments two to five of abdomen, and these with entire conspicuous ochraceous apical fasciae; segment six with dense appressed ochraceous tomentum and scattered erect black hairs; scopa fulvo-ochraceous, with intermixed black hairs on most of the segments laterally, interspersed almost across segments four and five, and these ventral plates with whitish apical fasciae evident laterally.

Type.—Female; British Guiana, April 28, 1901, (Crew), [U. S. N. M., no. 43094].

Megachile egressa new species

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face slightly broader above than long; eyes slightly converging below; clypeus protuberant medially (much as in *orbiculata*, Pl. XIV), the elevated portion flattened with the apical margin incurved, and with slight indications of crenulations; mandibles inconspicuously 5-dentate (derived from the condition in *orbiculata*), the two apical teeth approximate, the two inner ones small and approximate, the middle one very broad; cheeks below subequal to eyes in width, slightly narrowed above, the posterior margin carinate; vertex flat, hind margin incurved, not carinate; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum slightly shorter than the pedicel, the second joint almost twice the length of the first; mid and hind metatarsi slightly shorter than their tibiae but fully as wide; claws with minute basal teeth; abdomen broadly cordate, hind margins of the segments rather broadly depressed laterally, but not medially; segment six slightly concave laterally in dorsal aspect, in profile deeply concave with only a few erect basal hairs visible, the ventral plate largely bare, but without a bare apical lip.

Puncturation: Fine, close and shallow on cheeks, very fine and scattered on clypeus medially, coarser and closer laterally, the supraclypeal area largely impunctate, with fine scattered punctures laterally, coarse and very close on remainder of face;

widely scattered on vertex, especially laterally; mesonotum and pleura coarsely and somewhat striately rugoso-punctate, the scutellum finely rugoso-punctate; fine and scattered on discs of abdominal segments, closer medially and apically, largely impunctate anterior to the lateral depressed margins.

Color: Black; antennae and tegulae more piceous; wings faintly infuscated, slightly darker apically and in radial cell; spurs yellowish-ferruginous.

Pubescence: Creamy-white on cheeks, pleura, propodeum, legs and basal segment of abdomen; black on vertex; mixed black and white on face, clypeus, mesonotum and scutellum, with a few black hairs on pleura above, and some conspicuous black hairs on pronotal tubercles, the latter surrounded by a dense ochraceous fringe, and a similar dense tuft behind each wing base; discs of segments two to five largely bare, with only a very few scattered short black hairs, and with narrow inconspicuous subentire white apical fasciae; segment six covered with fine appressed tomentum, this more greyish basally, tinged with brown apically; scopa entirely orange, with a few lateral black hairs on segment six.

Type.—Female; Tapyta, Paraguay, November 1925, [Meyer]. *Paratypes.*—17 ♀; topotypical. 2 ♀; Abai, Paraguay, November, [all Meyer].

Megachile recta new species

Female.—Size: Length, 10 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face slightly broader above than long; eyes slightly converging below; clypeus produced medially (much as in *orbiculata*, Pl. XIV), the elevated portion flattened, with the apical margin incurved, and with a very slight median denticle; mandibles 4-dentate (somewhat similar to *orbiculata*), the two apical teeth approximate, the inner one truncate and slightly excavated, the mandible thus approaching the 5-dentate condition; cheeks below subequal to eyes in width, slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the second joint somewhat longer; mid and hind metatarsi shorter than the respective tibiae, but subequal to them in width; claws with sharp basal teeth; abdomen cordate, hind margins of the segments depressed at extreme sides, but not medially; segment six about straight laterally in dorsal aspect, in profile straight with suberect hairs visible toward the base, the ventral plate largely bare apically, but without a definite bare apical lip.

Puncturation: Fine, shallow and rather close on cheeks; coarser, deeper and definitely separated on vertex; very sparse on clypeus medially, but close laterally, the supraclypeal area largely impunctate medially; close on mesonotum and scutellum, slightly separated in center of mesonotum; deeper and more definitely separated on pleura; minute and quite close on abdomen basally, becoming more distinct and definitely separated on segment five, minute and very close on segment six.

Color: Black; antennae obscurely ferruginous; tegulae bright ferruginous; wings dilute yellowish, the nervures ferruginous; legs black, the spurs ferruginous.

Pubescence: Fuscous and quite long on face, vertex, cheeks (except below), thorax (except beneath), legs in large part, and segments one and two of abdomen, segments three to five with short black pubescence on discs and with entire, rather broad ochraceous apical fasciae, segment two with a similar but interrupted one; segment six with brownish appressed tomentum and a few erect black hairs basally; cheeks below and sternum with considerable pale pubescence; scopa white, black at sides of segment four, and entirely so on segments five and six.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratypes.*—7 ♀; topotypical, [Meyer].

Megachile habilis new species (Pl. XIV)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face about as broad as long; eyes slightly converging below; clypeus protuberant medially, the elevated portion flattened, with the apical margin incurved and with a slight indication of a median denticle; mandibles 4-dentate, the two apical teeth approximate, the inner one broadly truncate; cheeks subequal in width to eyes, slightly narrowed above, hind margin sharp but not carinate; vertex flat, hind margin incurved, not carinate; lateral ocelli somewhat nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, shorter than the second joint; scutellum evenly rounded posteriorly; mid and hind metatarsi subequal in width to their tibiae, but definitely shorter; claws with minute basal teeth; abdomen cordate, hind margins of the segments rather deeply depressed at extreme sides, but not at all medially; segment six very slightly concave laterally in dorsal aspect, in profile straight with evident erect hairs, the ventral plate largely bare, but without a bare apical lip.

Puncturation: Fine and close on cheeks and sides of face; more sparse on vertex medially, very sparse laterally; rather fine and close on clypeus laterally, but very sparse and irregular on the

elevated portion, almost impunctate, the supraclypeal area largely impunctate; mesonotum and pleura below striately and rather coarsely rugoso-punctate, pleura above and scutellum being finely and rather closely punctate; fine and rather sparse on abdomen, the discs impunctate anterior to the lateral depressions.

Color: Black; antennae dull ferruginous beneath; tegulae clear ferruginous; wings subhyaline, faintly clouded apically and in radial cell, the nervures ferruginous to piceous; legs obscurely reddish; spurs yellowish; abdomen with faint purplish reflections.

Pubescence: Creamy-white on cheeks, pleura, propodeum, legs, and basal segment of abdomen; dense ochraceous tufts surrounding pronotal tubercles and behind wing bases; black on vertex, mesonotum and scutellum, with a few black hairs on pleura beneath tegulae and a black tuft on each pronotal tubercle, the mesonotum with a short pale pilosoty in addition to the black pubescence; scutello-mesothoracic suture subfasciate; face with mixed black and white pubescence; short black and inconspicuous on discs of segments two to five of abdomen which have very narrow inconspicuous whitish apical fasciae, segment one with a few long black hairs, segment six with a closely appressed greyish tomentum and erect black hairs; scopa white, mostly black on segments five and six, and black laterally on segments three and four, the sternites subfasciate laterally.

Type.—Female; Chapada, Brazil, November, (H. H. Smith), [A. N. S. P., no. 4122]. *Paratypes.*—1 ♀; topotypical, [A. N. S. P.]. 129 ♀; Buenavista, Bolivia, [Meyer]. 2 ♀; Mount San Lorenzo, Santa Marta, Colombia, (2500 ft.), December 25, 1922, (M. A. Carriker), [Salt].

Megachile ignava new species

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8.5 mm.

Structure: Face broader above than long; eyes slightly converging below; clypeus protuberant medially (as in *orbiculata*, Pl. XIV), the elevated portion flattened, thickened and slightly incurved on apical margin; mandibles 4-dentate (much as in *orbiculata*), the two apical teeth approximate, the third about equidistant from the second and fourth; cheeks below subequal in width to eyes, narrower above, hind margins slightly carinate; vertex flat, hind margin incurved; lateral ocelli nearer edge of vertex than to eyes; basal joint of flagellum subequal to pedicel in length, the second joint longer; mid and hind metatarsi subequal in width to their tibiae, but shorter; claws without distinct basal teeth; abdomen cordate, hind margins of the

segments very slightly depressed laterally; segment six about straight laterally in dorsal aspect, in profile straight without evident erect hairs, the ventral plate largely bare, but without a bare apical lip.

Puncturation: Very fine and quite close on the shining cheeks, and very close on face; irregular in size and very sparse on elevated portion of clypeus and on supraclypeal area, these rather closely punctate laterally; sparse on vertex, especially laterally; scattered in center of mesonotum, but closely, striately rugoso-punctate laterally; fine and rather sparse on scutellum; pleura more coarsely rugoso-punctate, the punctures more separated posteriorly; fine and definitely separated, but not sparse on abdomen, except for a small area just anterior to the lateral apical depressions; segment six minutely and densely punctate.

Color: Black; antennae more brownish-fuscous beneath; tegulae bright ferruginous; wings very faintly infuscated, slightly darker apically and in radial cell, the nervures fuscous to ferruginous; spurs yellowish.

Pubescence: Whitish on cheeks, pleura, propodeum, legs and basal segment of abdomen; a narrow greyish fringe just above each tegula and around pronotal tubercles, and a dense tuft of the same color behind each wing base, the scutello-mesothoracic suture subfasciate; black on vertex, mesonotum and scutellum, very thin except on vertex, with a few black hairs just beneath each tegula, a black tuft on each pronotal tubercle, and a very few exceedingly short black hairs on abdomen, the latter entirely lacking fasciae; face with mixed black and white pubescence; segment six with very fine brownish tomentum; scopa white, mostly black on segments five and six, also on segment four except medially, and at sides of segments two and three; sternites four and five with slight indications of white apical fasciae, but these largely obscured in this unique specimen.

Type.—Female; Buenavista, Bolivia, [Meyer].

Megachile montezuma Cresson (Pl. XIV)

1878. *Megachile montezuma* Cresson, Trans. Am. Ent. Soc., VII, p. 129.
1911. *Megachile montezuma* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 258.

Chapada, Brazil, February and March, (H. H. Smith), [A. N. S. P., 8 ♂, 2 ♀]. Buenavista, Santa Cruz, Bolivia, [Meyer, 2 ♀]. Abai, Paraguay, November, [Meyer, 1 ♀]. All compared with type.

This species runs to *minuscula* Schrottky, in Schrottky's key,* and it is therefore possible that *minuscula* is a synonym of this.

*Rev. Mus. Paulista, IX, p. 136, (1913).

Megachile uniformis Mitchell

1929. *Megachile uniformis* Mitchell, Trans. Am. Ent. Soc., LIV, p. 349.

Chapada, Brazil, [Mitchell, 4 ♂ paratypes].

Megachile clara new species (Pl. XII)

Male.—Size: Length, 7.5 mm.; breadth of abdomen, 2.3 mm.; anterior wing, 5 mm.

Structure: Face about as broad above as long; eyes converging below; apical margin of clypeus slightly crenulate medially; mandibles 4-dentate, without an inferior projection; cheeks slightly narrower than eyes, simple below; vertex slightly rounded, hind margin incurved; basal joint of flagellum subequal to pedicel in length, the following joints about twice as long, the apical one not dilated, reaching slightly beyond the scutellum; front coxae thinly pubescent anteriorly, without spines or tubercles; front legs slender, the tarsi very narrow and not at all excavated; mid and hind legs slender, the mid tibia longer than the metatarsus, with an apical spur; abdomen slightly tapering posteriorly, apical margins of the segments quite strongly depressed laterally; dorsal surface of segment six flattened to the margin of the carina, sloping, the carina rounded on each side of the small semicircular median emargination, apical margin of the segment without evident teeth; segment seven quite conspicuous, transversely carinate apically; four sternites exposed.

Puncturation: Rather fine and close on vertex, mesonotum and pleura; finer and crowded on scutellum; shallow and close on cheeks; very fine and rather close on basal segments of abdomen, somewhat coarser and more sparse on apical segments, but segment six quite coarsely rugoso-punctate.

Color: Black; antennae beneath more piceous; apical tarsal joints ferruginous; tegulae bronzy; wings subhyaline, but rather strongly infuscated in region of radial cell, violaceous apically, the nervures fuscous; spurs yellowish.

Pubescence: Ochraceous and quite dense on face, with dense patches on pronotal tubercles, behind wing bases, and at lateral angles of mesonotum behind tegulae; more whitish on cheeks, pleura, legs and basal segment of abdomen; very thin, intermixed dark and light, on mesonotum and scutellum; very short and silvery on discs of abdominal segments, with intermixed black hairs on segment five, segment six with only scattered erect black hairs; segments one to five with white apical fasciae, subinterrupted on segments two to four, entire on segments one and five; sternites white fasciate at sides, the second with a median tuft of yellow hairs; tarsi without definite fringes.

Type.—Male; Prieta, Republic of Honduras, April 7, 1924, [Meyer].

Megachile bodkini Cockerell

1923. *Megachile bodkini* Cockerell, Ann. Mag. Nat. Hist., (9), XI, p. 452.

Trinidad Island, October 27, 1902, (Chipman), [Titus, 1 ♀].

Megachile coelioxiformis Schrottky

1909. *Megachile coelioxoides* Schrottky (nec Cresson), Anal. Soc. Cien. Argentina, LXVII, p. 220.

1910. *Megachile coelioxiformis* Schrottky, D. Ent. Zeitschr., 1910, p. 540.

1913. *Megachile coelioxiformis* Schrottky, Rev. Mus. Paulista, IX, p. 180.

Chapada and Corumba, Brazil, December, April and May, (H. H. Smith), [A. N. S. P., 4 ♂, 8 ♀].

Megachile praecipua new species (Pl. XIV)

Female.—Size: Length, 9 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 6 mm.

Structure: Face longer than wide; eyes converging below; apical margin of clypeus sharply denticulate; mandibles 4-dentate, the two apical teeth more closely approximated, with short cutting edges between the second, third and fourth; cheeks narrower than eyes, not carinate, somewhat narrowed above; vertex nearly flat, hind margin slightly incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly shorter than pedicel, the second joint about equal to the pedicel, the third longer and broader, the apical one only slightly longer than the others; mid and hind metatarsi slightly shorter and narrower than their tibiae; claws with acute but small basal teeth; abdomen rather long, narrow and parallel-sided, the apical margins of the segments slightly depressed laterally; segment six concave laterally in dorsal aspect, in profile very slightly concave with erect hairs visible toward the base, the ventral plate sparingly but uniformly pubescent, without a bare apical lip.

Puncturation: Minute and very close on cheeks; fine and distinctly separated on vertex; rather coarse and crowded on clypeus and supraclypeal area laterally, but each of these with a shining impunctate median area; moderately coarse and rather widely separated on mesonotum and pleura; relatively fine and close on scutellum; fine and quite widely separated on abdomen, but very close on segment six.

Color: Black; antennae beneath and mandibles apically dull reddish; apical tarsal joints ferruginous; tegulae bronzy-ferruginous; wings subhyaline, slightly clouded apically and in radial cell, the nervures pale ferruginous; spurs yellow.

Pubescence: Short and inconspicuous in general, but dense and white at sides of face, between antennae, on cheeks, posterior margin of pronotum, around pronotal tubercles, on posterior

margin of scutellum, and dense white patches at lateral angles of mesonotum behind tegulae; scutello-mesothoracic suture finely white fasciate; thin and blackish on vertex, discs of mesonotum and scutellum; thin and white on pleura, propodeum, legs, and segments one to four of abdomen where it is extremely short and inconspicuous; segment five with thin white pubescence over most of disc, but with erect black hairs apically, and segment six with a thin pale pruinosity and erect black hairs; segment one with a conspicuous white apical fascia, the following segments with only very thin inconspicuous pale fasciae; scopa white, mostly black on segment six.

Type.—Female; Rio Frio, Magdalena, Colombia, May 8, 1927, [Salt].

Megachile stomatura Cockerell

1917. *Megachile stomatura* Cockerell, Ann. Mag. Nat. Hist., (8), xx, p. 20.
1923. *Megachile stomatura* Cockerell, Ann. Mag. Nat. Hist., (9), xi, pp. 452 and 457.

Rio Frio, Sevillano, (Magdalena), and Cartagena, Colombia, September, October, November and April 1926–1927, on *Antigonon leptopus*, *Machaerium humboldtiarum*, and *Hibiscus rosasinensis*, [Salt, 7 ♂, 3 ♀].

Megachile aegra new species (Pls. X and XII)

Male.—Size: Length, 6.5 mm.; breadth of abdomen, 2 mm.; anterior wing, 5 mm.

Structure: Face about as broad as long; eyes converging below; apical margin of clypeus with a small median emargination; mandibles 3-dentate, without an inferior projection; cheeks narrower than eyes, not carinate, simple below; vertex slightly rounded, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum equal to pedicel in length, the following joints twice as long, the apical one not dilated; front coxae densely pubescent, with short, dentiform spines; front legs slender, especially the tarsi which are neither dilated nor excavated; middle and hind legs slender, the mid tibia longer than the metatarsus, with an apical spur; abdomen slightly tapering posteriorly, apical margins of the segments depressed laterally, medially also on apical segments; dorsal surface of segment six almost vertical, the carina prominent, narrowly rounded on each side of the semicircular median emargination, apical margin of the segment without evident teeth; segment seven barely visible, transversely carinate; four sternites exposed.

Puncturation: Very fine and close but not crowded on vertex, mesonotum, pleura, and on scutellum laterally, minute and densely crowded on scutellum medially and posterior margin of mesonotum; minute, shallow and rather close on the shining cheeks, as also on the abdominal segments, becoming coarser and more sparse apically, but segment six rugoso-punctate; tegulae very minutely punctate.

Color: Black; antennae and legs obscurely reddish-piceous, the apical tarsal joints more ferruginous; tegulae ferruginous; wings faintly infuscated, rather deeply so in region of radial cell, the nervures piceous; spurs yellowish.

Pubescence: Dense and entirely pale ochraceous on face and clypeus, with similar dense tufts on pronotal tubercles, behind wing bases, and at lateral angles of mesonotum behind tegulae; more whitish on cheeks, pleura, propodeum, legs and basal segment of abdomen; very thin and mostly ochraceous on vertex, mesonotum, and scutellum, with inconspicuous intermixed dark hairs on mesonotum and scutellum; very short and inconspicuous on abdomen, largely pale on segments one to four, but black toward apical margins, segments five and six with more conspicuous erect black pubescence, with no pale tomentum; segments one to five with thin, subentire whitish apical fasciae; tarsi without definite fringes.

Type.—Male; Chapada, Brazil, October, (H. H. Smith), [A. N. S. P., no. 4137]. *Paratypes.*—2 ♂; topotypical, [A. N. S. P.]. 1 ♂; Georgetown, British Guiana, (Crew), [Titus]. 1 ♂; Los Amatos, Guatemala, (Kellermann), [M. C. Z.].

Megachile alta new species (Pl. XIII)

Female.—Size: Length, 9 mm.; breadth of abdomen, 3.2 mm.; anterior wing, 6.5 mm.

Structure: Face about as broad above as long; eyes converging below; apical margin of clypeus with a broad median shining area which is very slightly incurved; mandibles 4-dentate, the two apical teeth acute, slightly angulate between the third and fourth; cheeks narrower than eyes, much narrowed above; vertex flat, very short, hind margin slightly incurved; lateral ocelli much nearer edge of vertex than to eyes; antennae short, basal joint of flagellum subequal in length to pedicel, slightly longer than the second joint, middle joints but slightly longer than broad; metatarsi shorter than the respective tibiae, the mid and hind ones rather broad but hardly equalling their tibiae; claws with strong basal teeth; abdomen narrowly cordate, apical margins of the segments quite strongly depressed laterally; segment six slightly concave laterally in dorsal aspect, in profile

almost straight with very short erect pubescence visible, the ventral plate largely bare apically, but without a distinct bare apical lip.

Puncturation: Very fine and close on cheeks, dense and rather fine on vertex except laterally; close and quite coarse on clypeus and supraclypeal area laterally, but these with median longitudinal impunctate shining spaces; very close on mesonotum, scutellum and pleura above, becoming coarse and separated on sternum; fine and close on abdomen basally, becoming more sparse on segments four and five, very fine and quite close on segment six.

Color: Black; antennae fuscous above, reddish beneath; tegulae ferruginous; wings hyaline, faintly clouded and violaceous apically, the nervures dark brown; legs reddish; spurs yellowish.

Pubescence: White on face and cheeks, dense at sides of face and clypeus, and between antennae; short and fuscous on vertex; white on thorax laterally, ventrally and posteriorly, mostly short and fuscous on disc of mesonotum, with scattered pale tomentum, longer and fuscous on scutellum, the scutello-mesothoracic suture thinly white fasciate; very short and black on discs of segments two to five, long and white on the basal segment, segments one to five with entire white apical fasciae, that on the first narrow and less distinct, the others broader and entire, segment six with a circular spot of white tomentum on each side of center, elsewhere with deep brown tomentum, and with very short erect black hairs; scopa white, blackish on segment six, and on segment five laterally and across the apical margin, sternites with conspicuous entire white apical fasciae beneath the scopa.

Type.—Female; Costa Rica, [A. N. S. P., no. 4125]. *Paratype.*—1 ♀; topotypical, with abdomen missing, [A. N. S. P.].

This seems to be somewhat like *M. bodkini* Cockerell, but the latter has black hair on the clypeus, and no ventral fasciae are mentioned in the description.

Megachile boliviensis Friese

1916. *Megachile boliviensis* Friese, Stett. Ent. Zeit., LXXVII, p. 340.
1921. *Megachile boliviensis* ♀ Friese, Stett. Ent. Zeit., LXXXII, p. 92.

San Mateo, Costa Rica, October 5, 1920, [Mitchell, 1 ♂ type].

The female which was described by Friese as this species, which I also have at hand, cannot be separated from *M. tuxtla* Cresson, and it appears somewhat doubtful, therefore, that it is the true female.

Megachile arcus new species (Pl. X)

Male.—Size: Length, 11 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 9 mm.

Structure: Face longer than wide; eyes slightly converging below; apical margin of clypeus slightly incurved medially; mandibles 4-dentate, without an inferior projection; cheeks subequal in width to eyes, simple below; vertex very slightly rounded, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than pedicel, the following joints twice the length of the first, the apical one neither dilated nor flattened, reaching beyond the scutellum; front coxae long pubescent anteriorly, with neither spines nor tubercles; front legs slender, the tarsi neither dilated nor excavated; mid tibia twice as long as the metatarsus, with an apical spur; hind legs slender; abdomen somewhat ovoid, apical margins of the segments rather deeply depressed laterally; segment six ventral in position, slightly protuberant at base medially, the carina drawn out into two acute teeth, one on each side of the broad and relatively shallow median emargination, apical margin of the segment with acute median teeth which are more widely separated from each other than from the acute lateral teeth; segment seven barely evident, slightly pointed medially; four sternites exposed.

Puncturation: Minute and close on cheeks; quite coarse and rather widely separated on vertex, mesonotum and scutellum; close on pleura, where they are fine above, more coarse below; minute and definitely separated on abdomen, more crowded on segments four and five; very minute and scattered on tegulae.

Color: Black, including antennae, tegulae and legs; wings uniformly lightly infuscated, the nervures blackish to fuscous; spurs ferruginous to fuscous.

Pubescence: Long, dense and pale ochraceous on face and clypeus, with a few black hairs at sides below; more whitish on cheeks, pleura, propodeum, sternum, legs and basal segments of abdomen, long and dense on cheeks below; long, thin and black on vertex and face above antennae, on mesonotum and scutellum, with lighter hairs around the margins of the two latter; front and middle tibiae with considerable black pubescence; pale on segment three basally, black apically, and entirely black on segment four, segments five and six with pale tomentum, thin on segment five, which has numerous long erect black hairs, more dense on segment six, which has both black and pale erect hairs; front and middle tarsal fringes white, rather long and thin.

Type.—Male; Santa Marta, Colombia, January 9, 1923, (M. A. Carriker), [Salt]. *Paratype.*—1 ♂; Mount San Lorenzo, Santa Marta, Colombia, 7000 ft., November 7, 1923, [Salt].

Megachile tuxtla Cresson (Pls. X, XII and XIV)

1878. *Megachile tuxtla* Cresson, Trans. Am. Ent. Soc., VII, p. 128.
1911. *Megachile tuxtla* Friese, Das Tierr., Lf. 28, Apidae, 1, p. 260.
1912. *Megachile tuxtla* Cockerell, Ann. Mag. Nat. Hist., (8), X, p. 25.
1920. *Megachile tuxtla* Cockerell, Proc. U. S. Nat. Mus., LV, p. 214.

San Jose, Costa Rica, May 20, 1903, (Crawford), [Titus, 2 ♂, 11 ♀].

Megachile ecuadoria Friese

1904. *Megachile ecuadoria* Friese, Zeitschr. Syst. Hym. Dipt., IV, p. 187.
1914. *Megachile ecuadoria* Cockerell, J. N. Y. Ent. Soc., XXII, p. 311.

Metucana, Peru, June–July, 1913, 7300 ft., (Brues), [M. C. Z., 1 ♂; det. Cockerell].

The carina of segment six and the mandibles are much as in *tuxtla* (Pl. XII).

Megachile fortuita new species (Pl. XIV)

Female.—Size: Length, 14 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 10 mm.

Structure: Face about as broad as long; eyes subparallel; apical margin of clypeus with a very shallow median incurved area, with slight crenulations on each side of this; mandibles 4-dentate, the two apical teeth approximate, rounded, the two inner teeth, acute but widely separate, cutting edges between the second, third and fourth; cheeks broader than eyes, but slightly narrowed above; vertex flat, hind margin incurved; lateral ocelli somewhat nearer edge of vertex than to eyes; basal joint of flagellum about twice as long as the pedicel and somewhat longer than the second joint; mid and hind metatarsi much shorter than their tibiae, but about as broad, the mid tarsal joints with apical fringes of red bristles beneath; claws with robust basal teeth; abdomen cordate, hind margins of the segments scarcely at all depressed, even laterally; segment six somewhat concave laterally in dorsal aspect and concave in profile, with much erect pubescence visible in profile, the ventral plate largely bare on apical half, but without a bare apical lip.

Puncturation: Very fine and close on cheeks and face, slightly coarser but close on vertex; more sparse between eyes and ocelli; relatively coarse but close on clypeus and supraclypeal area, but with a narrow impunctate line on the clypeus; close and rather fine on thorax above and laterally; very fine but distinctly separated on the shining abdomen, but densely crowded on segment six.

Color: Black; antennae somewhat paler below; tegulae obscurely bronzy-ferruginous; wings subhyaline, slightly infuscated apically and in radial cell, the nervures piceous; spurs dark ferruginous.

Pubescence: Long and white at sides of mesonotum and scutellum, on pleura above, on posterior face of propodeum, and on segments one to three of abdomen; black on head except for a slight amount of white around bases of antennae, and black on pleura below, sternum, legs, and segments four to six of abdomen, the abdomen entirely lacking fasciae, but the pubescence dense and long throughout; scopa bright red on segments three to five, black on segment two and six, and at extreme sides of segment three.

Type.—Female; Peru, December 19, 1875, [M. C. Z., no. 16206].

Megachile impudens new species (Pl. XIV)

Female.—Size: Length, 10.5 mm.; breadth of abdomen, 3 mm.; anterior wing, 7 mm.

Structure: Face slightly longer than broad; eyes subparallel; apical margin of clypeus very slightly crenulated; mandibles 4-dentate, the teeth acute and about equally spaced; cheeks below about as broad as eyes, slightly narrowed above; vertex slightly convex, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum slightly longer than the pedicel, the second joint subequal to the pedicel; mid and hind metatarsi distinctly shorter and slightly narrower than their tibiae, the mid tarsal joints fringed at apex beneath with red bristles; claws with sharp basal teeth; abdomen cordate, apical margins of the segments rather deeply depressed laterally; segment six straight laterally in dorsal aspect, in profile straight with erect hairs visible, the ventral plate quite uniformly pubescent, without a bare apical lip.

Puncturation: Fine and close on cheeks; more distinctly separated on vertex; coarser but crowded on clypeus, sparse medially on supraclypeal area; fine and close on thorax, but somewhat sparse on mesonotum medially; very fine and close on basal abdominal segments, becoming more coarse and distinct on apical segments.

Color: Black; antennae brownish beneath; tegulae bronzy-piceous; wings subhyaline, faintly infuscated apically and in radial cell, nervures fuscous; spurs black.

Pubescence: White at sides of face, between antennae, on cheeks above, on mesonotum anteriorly and laterally, around pronotal tubercles, on propodeum above, and on basal segment of abdomen; black on clypeus, supraclypeal area, vertex, cheeks below, discs of mesonotum and scutellum, pleura, sternum, legs, propodeum below, and discs of segments two to six of abdomen;

segments one to five with very narrow entire pale ochraceous apical fasciae; scopa bright fulvous except for some black on segment two laterally.

Type.—Female; Cordova, Argentina, (Davis), [M. C. Z., no. 16204].

Megachile perspicua new species (Pl. XIV)

Female.—Size: Length, 11 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7.5 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus slightly incurved medially, otherwise entire; mandibles 4-dentate, the teeth rather acute; cheeks subequal to eyes in width, slightly narrowed above; vertex slightly convex, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the second joint very slightly shorter; mid and hind metatarsi distinctly shorter than their tibiae, but almost as wide; claws with minute basal teeth; abdomen cordate, apical margins of the segments rather deeply depressed for their entire width; segment six slightly concave laterally in dorsal aspect, in profile concave apically, with suberect hairs visible, the ventral plate bare on apical middle, without a bare apical lip.

Puncturation: Very fine and close on cheeks; coarse and close on clypeus; fine and rather close on vertex; supraclypeal area impunctate medially; fine and rather sparse on mesonotum medially, closer laterally; close on scutellum and on pleura above, more coarse and distinctly separated on pleura below; fine and close on basal abdominal segment, becoming more coarse and scattered on segment five, segment six more finely and closely punctate.

Color: Black; antennae more brownish beneath; mandibles and femora obscurely reddish; tegulae blackish-piceous; wings subhyaline, slightly clouded apically, the nervures blackish; spurs blackish.

Pubescence: Pale ochraceous at sides of face and around antennae, on cheeks posteriorly, on pronotum, pleura, propodeum, mesonotum anteriorly, mostly so on legs, and conspicuous patches behind tegulae and at sides of basal abdominal segment; black on clypeus, vertex, cheeks below and along orbits, on discs of mesonotum and scutellum, on front coxae, and discs of segments two to five of abdomen; segments one to five with entire conspicuous ochraceous apical fasciae, and the scutello-mesothoracic suture subfasciate; segment six with subappressed pale tomentum and scattered erect darker hairs; scopa whitish-ochraceous, black on segment six.

Type.—Female; Cordova, Argentina, (Davis), [M. C. Z., no. 16203].

Megachile fruticosa new species

Female.—Size: Length, 12 mm.; breadth of abdomen, 4.5 mm.; anterior wing, 9 mm.

Structure: Face with length and breadth subequal; eyes slightly converging below; apical margin of clypeus straight, minutely denticulated; mandibles 4-dentate (much as in *tuxtla*, Pl. XIV), the inner tooth broadly truncate, the others acute, cutting edges between the second, third and fourth; cheeks below subequal to eyes in width, slightly narrower above; vertex flat, hind margin incurved; lateral ocelli nearer edge of vertex than to eyes; (antennae beyond scape missing); mid and hind metatarsi very slightly narrower but considerably shorter than their tibiae; claws with robust sharp basal teeth; abdomen cordate, hind margins of the segments slightly depressed laterally; segment six slightly concave laterally in dorsal aspect, in profile also very slightly concave, with much erect pubescence evident, the ventral plate quite densely pubescent, without a bare apical lip.

Puncturation: Fine and close on cheeks and face, and on vertex medially, rather sparse on vertex laterally; close and somewhat more coarse on clypeus and supraclypeal area; rather sparse on mesonotum medially where the surface is shining, closer anteriorly and laterally, as also on scutellum; rather coarse on pleura, definitely separated in part, but with areas of close punctures above and below; fine and quite close on abdomen, extremely dense and fine on segment six.

Color: Black, including tegulae and legs; wings very faintly infuscated, slightly darker in region of radial cell, the nervures fuscous; front spurs ferruginous, the others piceous.

Pubescence: Greyish-white on face and cheeks, with tufts of the same color around pronotal tubercles and above each tegula; a few black hairs intermixed on clypeus apically, on cheeks below, and between antennae; mesonotum and scutellum with long intermixed greyish and blackish pubescence; long and black on vertex, pleura, propodeum, sternum, and abdomen dorsally, and mostly black and quite long on legs; more fuscous on outer faces of front and middle metatarsi; abdomen entirely lacking fasciae; scopa entirely deep black.

Type.—Female; Colombia (?), (G. F. Baker), [U. S. N. M., no. 43093].

Megachile redondensis new species (Pl. XIV)

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face slightly broader above than long; eyes converging below; apical margin of clypeus straight, finely denticulate; mandibles 4-dentate, the inner tooth broadly and sharply truncate, the others acute; cheeks below subequal in width to eyes, narrowed above; vertex slightly convex, hind margin quite strongly incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum very slightly longer than pedicel, shorter than second joint, the middle joints about one and a half times longer than broad; mid and hind metatarsi definitely shorter and narrower than their tibiae; claws with distinct basal teeth; abdomen cordate, apical margins of the segments depressed except medially; segment six slightly concave laterally in dorsal aspect, in profile slightly concave with long erect hairs visible, the ventral plate largely bare apically, but without a distinct bare apical lip.

Puncturation: Very fine and close on cheeks; fine and numerous but well separated on vertex, rather large, shallow and close on clypeus and supraclypeal area, but these with narrow median areas in which shining spaces are evident; fine and close on thorax, but somewhat separated in center of mesonotum, scutellum, and on pleura above; sparse on sternum; fine on abdomen, close laterally, more sparse medially, very fine and close on segment six.

Color: Black; antennae obscurely reddish beneath; tegulae obscurely reddish; wings subhyaline, more distinctly clouded apically and in costal half of radial cell, nervures ferruginous; spurs yellowish-ferruginous.

Pubescence: White on cheeks and at sides of face; fuscous on clypeus and vertex; mixed white and fuscous between antennae; whitish on thorax laterally and posteriorly, mesonotum and scutellum with short whitish pubescence and longer erect fuscous hairs, these very long on scutellum; white on legs with some intermixed fuscous hairs on outer face of front tibia; fulvous on tarsi beneath; whitish on basal segment of abdomen, more ochraceous on segment two and base of segment three, short and blackish or fuscous on segments three to five; segments one to five with entire narrow apical fasciae, the basal one whitish, the others more ochraceous, segment six with appressed greyish tomentum and long erect black hairs; scopa fulvous, rather pale at extreme base, fuscous on apical half of segment six.

Type.—Female; Mount Redondo, Costa Rica, January 1903, [A. N. S. P., no. 4132]. *Paratype.*—1 ♀ (in poor condition); Guadalajara, Mexico, (McClendon), [A. N. S. P.].

This is possibly only a color variety of *tuxtla*, being almost identical structurally.

Megachile cockerelli Rohwer (Pls. X, XII and XIV)

1923. *Megachile cockerelli* Rohwer, Proc. Ent. Soc. Wash., xxv, p. 102.

Meadow Valley, Mexico, (Townsend), [Titus, 2 ♂, 1 ♀].

Megachile conferta new species (Pl. X)

Male.—Size: Length, 13 mm.; breadth of abdomen, 5 mm.; anterior wing, 11 mm.

Structure: Face almost square; eyes subparallel; apical margin of clypeus subemarginate medially; mandibles 3-dentate, the middle tooth strongly sinuate, the outer margin of the mandible quite strongly angulate toward apex, without an inferior projection; cheeks broader than eyes, simple below; vertex flat, hind margin strongly concave; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum fully as long as the following joints, more than twice the length of the pedicel, the apical joint slightly flattened but not dilated; front coxae rather densely pubescent anteriorly, without distinct spines; front femora robust, but not definitely keeled; front tarsi flattened and somewhat dilated, but not excavated, the metatarsus parallel-sided, almost as long as the other joints combined; middle legs robust, the tibia longer than the metatarsus, with an apical spur; hind femora robust, squarish in cross-section, the lower inner margin drawn out into a carina-like protuberance near the base; hind metatarsi short and robust; abdomen short and very broad, apical margins of the apical segments rather broadly depressed laterally; segment six largely hidden by segment five, the carina quite conspicuous, consisting of two obtusely triangular projections separated by a semicircular emargination, apical margin of the segment with carinate median teeth, the lateral ones acute; segment seven visible, obtuse; four sternites exposed.

Puncturation: Fine and densely crowded on clypeus, face, cheeks, and entire thorax; close on vertex medially, but rather sparse laterally; very sparse on the polished mandibles; fine and close on the basal abdominal segments, becoming somewhat more sparse on segment five, but densely crowded on segment six.

Color: Black; antennae obscurely fuscous below; mandibles obscurely reddish; legs piceous, the apical tarsal joints ferruginous, the front metatarsi creamy-white, dark along the anterior margin; tegulae fuscous; wings subhyaline, the nervures fuscous; spurs fuscous to black.

Pubescence: Long and dense throughout; pale ochraceous on clypeus and face medially, on front coxae and femora, pleura anteriorly, around margin of dorsum of thorax, on propodeum, and basal abdominal segment; fuscous on lower angle of cheeks; deep black on cheeks, sides of face, vertex, mesonotum, scutellum, pleura posteriorly, front tibiae, the four posterior legs entirely, and on abdominal segments beyond the first; front tarsi rather densely clothed with short whitish pubescence, forming a very short posterior fringe, the anterior margin with deep ferruginous pubescence.

Type.—Male; Pano (?), Peru, April 1 [or January 4 ?], 1895, [M. C. Z., no. 16207].

Megachile praefica Gribodo (?)

1894. *Megachile praefica* Gribodo, Act. Soc. Scient. Chili, IV, p. 204.
1921. *Megachile saulcyi* (= *praefica*), Herbst, Stett. Ent. Zeit., LXXXII, p. 103.

Santiago, Chili, [Mitchell, 1 ♂, 1 ♀].

This is a definitely fasciate form, quite distinct from *saulcyi* although a close affinity, which runs to *praefica* in Friese's key.* It is queried since it has been given as a synonym of *saulcyi*.

Megachile saulcyi Guerin

1845. *Megachile saulcyi* Guerin, Icon. Reg. An. Cuvier, VII, Insecta, p. 450.
1851. *Megachile chilensis* Spinola, Hist. Fis. Chili, Zool., VI, p. 178.
1894. *Megachile chilensis* Gribodo, Act. Soc. Scient. Chili, IV, p. 203.
1899. *Megachile saulcyi* (= *chilensis*) Perez, Rev. Chil. Hist. Nat., III, p. 109.
1904. *Megachile chilensis* Vachal, Rev. d'Ent., XXIII, p. 11.
1904. *Megachile saulcyi* (= *chilensis*) Alfken, Rev. Chil. Hist. Nat., VIII, p. 141.
1905. *Megachile chilensis* Cockerell, Trans. Am. Ent. Soc., XXXI, p. 338.
1909. *Megachile saulcyi* Vachal, Rev. d'Ent., XXVIII, p. 8.
1917. *Megachile saulcyi* (and *chilensis*) Herbst, D. Ent. Zeitschr., 1917, p. 267.
1921. *Megachile saulcyi* (= *chilensis*, = *praefica*) Herbst, Stett. Ent. Zeit., LXXXII, p. 103.

Chile, [Mitchell, 1 ♂]. Pudabuel, November 30, 1921, [Mitchell, 1 ♀]. Yura, Peru, August 23, (Cockerell), [Mitchell, 1 ♀]. Arequipa, Peru, October 28, 1898, [Titus, 1 ♀].

Megachile fumata new species (Pl. XIV)

Female.—Size: Length, 12 mm.; breadth of abdomen, 4 mm.; anterior wing, 9.5 mm.

Structure: Face about as broad above as long; eyes slightly converging below; apical margin of clypeus with a shallow median

*Das Tierr. Lf. 28, Apidae, 1, (1911).

emargination, in the center of which is a rather strong denticle; mandibles 4-dentate, the inner tooth broadly truncate, the truncation slightly incurved, the mandible thus approaching the 5-dentate condition, the other teeth acute; cheeks below slightly narrower than eyes, much narrower above; vertex very slightly convex, hind margin strongly incurved; lateral ocelli very slightly nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, the second joint very slightly longer, middle joints only slightly longer than broad; all the metatarsi shorter and somewhat narrower than their tibiae; claws with strong basal teeth; abdomen conical, the segments slightly depressed basally and apically; segment six very slightly concave laterally and rounded apically in dorsal aspect, in profile straight, with numerous evident erect hairs, the ventral plate quite uniformly pubescent throughout, without a bare apical lip.

Puncturation: Fine and close on cheeks; fine, evenly distributed and distinctly separated on vertex; deep and quite coarse on clypeus and supraclypeal area, very close laterally, more separated along the median line; shallow and sparse on mesonotum medially, fine and crowded laterally, the surface between the punctures dull; rather fine and close on scutellum; more coarse and deep on pleura; fine, evenly distributed and rather sparse on segments one to five of abdomen, close on segment six.

Color: Black; antennae fuscous beneath; tegulae yellowish-hyaline, with a dark fuscous spot anteriorly; wings pale fuliginous, darker in region of radial and submarginal cells, the nervures black or fuscous; spurs yellowish; abdomen with slight purplish reflections.

Pubescence: Whitish at sides of face and on cheeks; fuscous on clypeus and vertex, mixed whitish and fuscous between and above antennae; white on thorax laterally and beneath, very thin on mesonotum, pale anteriorly, but otherwise fuscous; long and fuscous on scutellum and on propodeum posteriorly, but the latter fringed above and at sides with conspicuous dense white pubescence; a conspicuous cream-colored band on hind margin of pronotum, fuscous in front of this and laterally, and a similar tuft behind each tegula; white on legs, ferruginous beneath tarsi; basal abdominal segment with a distinct narrow white apical fascia, the other segments at most subfasciate laterally, pubescence of the discs thin and inconspicuous, fuscous on segment one, with a little pale tomentum on the others; segment six with dense appressed dark brownish pubescence on apical half, with numerous erect black hairs; scopa creamy-white, black on segment six, with a few black hairs on segment five.

Type.—Female; Guapiles, Costa Rica, July 1915, (D. E. Harrower), [A. N. S. P., no. 4131].

This appears to be close to *M. perpunctata* Cockerell, but that is described as having 3-dentate mandibles, with a very closely punctate thorax, piceous tegulae, and white fasciae on segments one and two of abdomen. *M. irritans* Smith, which may also be close, has pubescence of face white, and vertex with a little black pubescence, no mention being made of dark pubescence on clypeus.

Megachile simplicipes Friese (Pl. XIV)

1920. *Megachile nigrolateralis* Cockerell (not *lachesis* var.), Proc. U. S. Nat. Mus., LV, p. 217.
1921. *Megachile simplicipes* Friese, Stett. Ent. Zeit., LXXXII, p. 93.
1927. *Megachile atrolateralis* Cockerell, Am. Mus. Nov., no. 274, p. 5.

San Mateo, Costa Rica, March 1921, [Mitchell; type ♀]. Pto. Castello, Republic of Honduras, March 26, 1924, [Meyer, 10 ♀]. All compared with *nigrolateralis* type.

Megachile hamata new species

Female.—Size: Length, 13 mm.; breadth of abdomen, 4 mm.; anterior wing, 8 mm.

Structure: Face broader above than long; eyes converging below; apical margin of clypeus subcrenulate; mandibles 4-dentate (much as in *simplicipes*, Pl. XIV), the two apical teeth approximate, a slight angle between the third and fourth; cheeks considerably narrower than eyes; vertex flat, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum only slightly longer than the pedicel, shorter than the second joint, the apical one somewhat longer than the others; mid and hind metatarsi considerably shorter and narrower than their tibiae, mid tarsal joints fringed apically beneath with reddish bristles; claws with sharp basal teeth; abdomen cordate, apical margins of the segments narrowly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with numerous visible erect hairs, the ventral plate densely pubescent, without a bare apical lip.

Puncturation: Very fine and close on vertex, face and cheeks, but vertex with a narrowly triangular median impunctate area; coarse on clypeus and supraclypeal area, close laterally, sparse medially; sparse on mesonotum medially, close and fine laterally, as also on scutellum and pleura; fine and quite close on the shining abdomen, especially basally.

Color: Black; antennae beneath and tegulae more piceous; wings uniformly faintly infuscated, the nervures fuscous to black, stigma more ferruginous; spurs brownish-ferruginous.

Pubescence: White and dense on cheeks, pleura and propodeum; yellowish-white on face; very short and more ochraceous on clypeus; thin and black on vertex, disc of mesonotum, scutellum, and a black tuft on the pronotal tubercles; tegulae surrounded by dense white pubescence except posteriorly, and scutello-mesothoracic suture white fasciate; greyish-white on discs of segments one to five of abdomen, this becoming blackish along apical margins of the segments, long on the basal segment, very short on all the others, segment six however with long erect black hairs, without appressed tomentum; scopa white, entirely black on segment six.

Type.—Female; Rio Frio, Magdalena, Colombia, December 26, 1926, [Salt]. *Paratypes.*—2 ♀; topotypical, [Salt]. 1 ♀; Santa Marta, Colombia, January 9, 1923, (M. A. Carriker), [Salt].

One of the topotypical paratypes was caught at flowers of *Machaerium humboldtiarum*, on April 15, 1927. This specimen, and the one from Santa Marta, are slightly smaller than the type, about 11.5 mm. in length, but are apparently identical otherwise.

Megachile nuda new species

Female.—Size: Length, 11 mm.; breadth of abdomen, 4 mm.; anterior wing, 9 mm.

Structure: Face very slightly broader than long; eyes subparallel; apical margin of clypeus very minutely and irregularly denticulate, subentire; mandibles 4-dentate (much as in *simplicipes*, Pl. XIV), the two apical teeth acute, the third very broad and low, angulate between the third and fourth and thus approaching the 5-dentate condition; cheeks below slightly narrower than eyes, slightly narrowed above; vertex flat, hind margin strongly incurved; lateral ocelli much nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, as also to the second joint; mid and hind metatarsi somewhat shorter and narrower than their tibiae; claws with short, sharp basal teeth; abdomen conical, apical margins of the segments depressed laterally but not medially; segment six straight laterally in dorsal aspect, in profile straight with numerous visible erect hairs, the ventral plate densely pubescent, without a bare apical lip.

Puncturation: Fine and close on cheeks, face and vertex, the latter with a small median impunctate area; coarse and sparse, at least medially, on clypeus and supraclypeal area; fine and quite sparse on disc of mesonotum medially, fine and close laterally, as also on scutellum and on pleura above, more dis-

tinctly separated and slightly coarser on pleura below; very fine and sparse on the polished abdomen, but segment six more closely punctured.

Color: Black; antennae beneath obscurely brownish-piceous; mandibles, legs and tegulae bright ferruginous; wings faintly infuscated, more so apically and in radial cell, the nervures piceous to blackish; spurs ferruginous; abdomen with purplish reflections; mesosternum with a broad ferruginous median stripe.

Pubescence: Dense and creamy-white at sides of face, on cheeks, around pronotal tubercles, at lateral margins of propodeum, and at posterior lateral angles of mesonotum, elsewhere thin, short and inconspicuous; yellowish on clypeus, face medially, vertex and legs, but more whitish between antennae and on anterior portion of mesonotum, on prosternum, and on mesopleura in part; fuscous or black on disc of mesonotum, scutellum, larger part of pleura, and at sides of basal abdominal segment; abdomen largely bare, without fasciae, and with very short pale pubescence visible only toward the sides; segment six with a very fine pale pilosity and erect black hairs; scopa creamy-white, entirely black on segment six, and a few black hairs at sides of segment five.

Type.—Female; Pedra Branca, Brazil, April, (H. H. Smith), [A. N. S. P., no. 4130]. *Paratypes.*—1 ♀; topotypical. 2 ♀; Chapada and Corumba, Brazil, April, [A. N. S. P.]. 2 ♀; Buenavista, Bolivia, [Meyer].

This is very close to *simplicipes* Friese, differing principally in the bright red legs and tegulae, and it is possible that it is only a race or variety of *simplicipes*.

Megachile acris new species (Pl. XIII)

Female.—Size: Length, 10 mm.; breadth of abdomen, 2.7 mm.; anterior wing, 6 mm.

Structure: Face slightly longer than broad; eyes slightly converging below; apical margin of clypeus with slight irregular crenulations; mandibles 4-dentate, the two apical teeth approximate, the others quite distant, no cutting edges evident; cheeks narrower than eyes, but slightly narrowed above; vertex very slightly convex, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum very slightly longer than the pedicel and also the second joint, these latter of about equal length; mid and hind metatarsi slightly shorter and narrower than their tibiae; claws with minute basal teeth; abdomen narrowly cordate, apical margins of the segments slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect and in profile, with numerous short erect

hairs visible in profile, the ventral plate quite densely pubescent, without a bare apical lip.

Puncturation: Very fine and close on cheeks, face, vertex, mesonotum and scutellum; somewhat coarser but close on clypeus; fine and close on pleura above, but more coarse and sparse below; rather fine and close, but distinctly separated on the shining abdomen, but very fine and densely crowded on segment six.

Color: Black; antennae more brownish-piceous below; tegulae piceous; wings subhyaline, faintly infuscated apically, deeply so in radial cell, the nervures piceous; spurs dark reddish.

Pubescence: Short in general; whitish on cheeks, pleura below, propodeum, legs and basal segment of abdomen, densely so on pronotal tubercles; white around antennae, but with long black hairs intermixed between them; black on clypeus, vertex, disc of mesonotum, scutellum, and a large black patch on pleura above; very short and pale on discs of segments two to five of abdomen; segments one to five with entire pale ochraceous apical fasciae; segment six with a fine silvery pruinosity, and erect black hairs; sternites two to five with white apical fasciae evident laterally; scopa pale ochraceous, black apically on segment six.

Type.—Female; Villarrica, Paraguay, February 1923, [Meyer].

Megachile stabilis new species (Pl. XIV)

Female.—Size: Length, 9 mm.; breadth of abdomen, 3 mm.; anterior wing, 7.5 mm.

Structure: Face slightly longer than broad; eyes subparallel; apical margin of clypeus slightly incurved medially, otherwise entire; mandibles 4-dentate, the two apical teeth approximate, the third acute, inner one rounded; cheeks slightly narrower than eyes, slightly narrowed above, the posterior margin carinate; vertex very slightly convex, hind margin almost straight; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to the pedicel and also to the second joint, the third and following ones longer; mid metatarsus but very slightly narrower and shorter than the tibia, the hind metatarsi distinctly shorter and narrower than their tibiae; claws with minute basal teeth; abdomen cordate, hind margins of the segments depressed laterally, but not medially; segment six very slightly concave laterally in dorsal aspect, in profile straight with no visible erect hairs, the ventral plate uniformly pubescent, without a bare apical lip.

Puncturation: Fine and densely crowded on face, vertex, cheeks, mesonotum, scutellum, and pleura above; somewhat coarser and more definitely separated on clypeus and supraclypeal area medially, and on pleura below; very fine and close, but not crowded, on abdomen throughout.

Color: Black, including mandibles and legs; antennae blackish-piceous beneath; tegulae blackish-piceous; wings slightly infuscated, more so apically and quite deeply so in radial cell, the nervures piceous; spurs ferruginous.

Pubescence: Very short and inconspicuous throughout, but with short dense white pubescence on margin of pronotum and around pronotal tubercles; otherwise thin and white on face, cheeks, pleura, propodeum, legs, on mesonotum anteriorly, and at sides of basal abdominal segment; blackish on vertex, disc of mesonotum, scutellum, and discs of segments one to four of abdomen where it is extremely short, segments five to six with a fine inconspicuous pale pruinosity and short but erect blackish hairs toward the sides; segments two to five with pale apical fasciae evident laterally; scopa whitish-ochraceous, black on segments five and six laterally.

Type.—Female; Buenavista, Bolivia, [Meyer]. *Paratypes.*—5 ♀; topotypical, [Meyer].

Megachile kartaboensis new species (Pl. XIV)

Female.—Size: Length, 10.5 mm.; breadth of abdomen, 4 mm.; anterior wing, 9 mm.

Structure: Face longer than broad; eyes subparallel; apical margin of clypeus incurved, entire; mandibles 4-dentate; cheeks below subequal to eyes in width, narrower above, hind margins carinate; vertex slightly convex, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, the second joint very slightly longer and considerably broader; mid metatarsi slightly broader than their tibiae but not quite as long, the hind metatarsi slightly shorter and narrower than their tibiae; claws with sharp basal teeth; abdomen cordate, apical margins of the segments not at all depressed; segment six straight laterally in dorsal aspect, in profile straight with no evident erect hairs, the ventral plate rather uniformly pubescent, without a bare apical lip.

Puncturation: Fine and densely crowded on face, vertex, mesonotum and scutellum; minute and shallow on the shining cheeks; deep and more distinctly separated on clypeus; rather fine and close on pleura above, coarser, deep and sparse below; minute and densely crowded on abdomen throughout.

Color: Black, including antennae, mandibles, legs and tegulae anteriorly, the latter coppery medially; wings faintly infuscated, more deeply so apically, and deep in radial cell; spurs piceous to blackish.

Pubescence: Extremely short and inconspicuous throughout, pale in part, but the general aspect black; whitish on cheeks, pleura, propodeum, and densely so around pronotal tubercles; fuscous on face, vertex, disc of mesonotum and scutellum, a black patch on pleura above, and entirely black on discs of abdominal segments, these not fasciate; segment six with only very fine fuscous tomentum, with no erect hairs; femora largely pale pubescent, short and fuscous on tibiae, dense brownish-fuscous on outer faces of front and middle tarsi, hind tarsi with sparse short dark hairs, hind femora and tibiae with fine appressed silvery tomentum on their posterior faces; scopa whitish, with intermixed fuscous hairs laterally and apically.

Type.—Female; Kartabo, British Guiana, July–August 1920, (W. M. Wheeler), [M. C. Z., no. 16212].

Megachile suavis new species (Pl. XIII)

Female.—Size: Length, 9 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 6 mm.

Structure: Face longer than broad; eyes very slightly converging below; apical margin of clypeus entire, very slightly incurved; mandibles indistinctly 5-dentate, the fourth tooth inconspicuous; cheeks below subequal in width to eyes, slightly narrowed above; vertex slightly convex, hind margin very slightly incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel, and also to the median antennal joints, the second being considerably shorter; mid and hind metatarsi shorter and narrower than their tibiae; claws with sharp basal teeth; abdomen rather long cordate, apical margins of the segments slightly depressed laterally; segment six nearly straight laterally in dorsal aspect, in profile straight with only suberect hairs visible, the ventral plate rather densely pubescent, without a bare apical lip.

Puncturation: Fine and close but not crowded on vertex, cheeks, mesonotum and scutellum; somewhat coarser but close on pleura; coarse on clypeus and supraclypeal area, close laterally, more distinctly separated medially; very fine and rather close on abdomen, closely crowded on segment six.

Color: Black, including antennae, tegulae and legs; wings subhyaline, slightly clouded apically and on costal margin of radial cell, the nervures blackish; front spurs ferruginous, mid and hind ones black.

Pubescence: Whitish on cheeks, pronotum, mesonotum anteriorly and laterally, pleura, propodeum, legs and basal segment of abdomen; blackish on vertex, disc of mesonotum, scutellum, and a rather large black patch on pleura above; mixed black and white on face and clypeus; very short and pale on segments two

to five of abdomen, whitish on basal segment, but becoming ochraceous on segment five, segments one to five with entire, pale apical fasciae, that on segment five more ochraceous, the others whitish; segment six with a thin ochraceous pilosity and short suberect black hairs; sternites two to five with entire conspicuous white apical fasciae beneath the scopa, the scopa pale ochraceous, blackish at tip of segment six.

Type.—Female; Villarrica, Paraguay, November 1923, [Meyer]. *Paratype.*—1 ♀; topotypical, [Meyer].

Megachile affabilis new species (Pl. XIV)

Female.—Size: Length, 9 mm.; breadth of abdomen, 3 mm.; anterior wing, 6 mm.

Structure: Face about as broad as long; eyes slightly converging below; apical margin of clypeus with three small distinct denticles; mandibles 4-dentate, the teeth rather low but acute; cheeks narrower than eyes, not narrowed above; vertex convex, hind margin incurved; lateral ocelli subequally distant from eyes and edge of vertex; basal joint of flagellum subequal in length to pedicel as also to the second joint, the following ones very slightly longer; mid and hind metatarsi considerably shorter and narrower than their tibiae; claws with barely distinguishable basal teeth; abdomen cordate, apical margins of the median segments slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile straight with numerous visible erect hairs, the ventral plate thinly pubescent apically, without a bare apical lip.

Puncturation: Close, but not crowded, and rather fine, on clypeus, vertex, mesonotum, pleura above, and scutellum; supraclypeal area with a small median impunctate space; pleura more coarsely punctate below; cheeks more finely and closely punctate; fine and close on abdomen throughout.

Color: Black; antennae beneath and tegulae more piceous; wings subhyaline, slightly infuscated apically, nervures blackish; spurs ferruginous.

Pubescence: White at sides of face and between antennae, on cheeks, pleura, sternum, propodeum, legs, and basal segment of abdomen; black on vertex, disc of mesonotum and scutellum, with a very few black hairs beneath each tegula; white on clypeus, with long erect black hairs intermixed, as also between antennae; scutello-mesothoracic suture whitish fasciate; thin and obscurely ochraceous to blackish on discs of segments two to five of abdomen, segments one to five with entire whitish apical fasciae, more ochraceous apically; segment six with thin pale ochraceous appressed pubescence and numerous erect bristle-like black hairs;

scopa whitish basally, becoming pale fulvous on segment five, black on segment six.

Type.—Female; Villarrica, Paraguay, 1923, [Meyer]. *Paratypes.*—1 ♀; Tapyta, Paraguay, November 1925. 1 ♀; St. Amaro, Brazil, September–November 1921, [all Meyer].

Megachile riojanensis new species (Pl. XIII)

Female.—Size: Length, 8 mm.; breadth of abdomen, 2.5 mm.; anterior wing, 5.5 mm.

Structure: Face slightly longer than broad; eyes slightly converging below; apical margin of clypeus minutely crenulate; mandibles 4-dentate, the teeth acute, the two apical ones approximate; cheeks below almost as wide as eyes, narrowed above, not carinate; vertex slightly convex, hind margin incurved; lateral ocelli slightly nearer edge of vertex than to eyes; basal joint of flagellum subequal in length to pedicel, slightly longer than the second joint, the following ones broader but not much longer; mid and hind metatarsi slightly shorter and narrower than their tibiae; claws with very minute basal teeth; abdomen cordate, the concavity of the basal segment almost obliterated, with a median ridge and a slight concavity on each side; apical margins of the segments very slightly depressed laterally; segment six very slightly concave laterally in dorsal aspect, in profile also slightly concave and with visible erect hairs, the ventral plate uniformly and thinly pubescent, without a bare apical lip.

Puncturation: Very fine and close on cheeks, face, vertex, mesonotum, scutellum and pleura above; more coarse but close on clypeus; coarse and rather sparse on pleura below; rather fine on the abdomen, close on basal segments, becoming more scattered on segment five, very minute and close on segment six.

Color: Black; antennae brownish-piceous below; legs and tegulae more reddish-piceous; wings subhyaline, faintly infuscated apically, quite deeply so in radial cell, nervures ferruginous to piceous; spurs ferruginous to piceous.

Pubescence: Rather short and thin in general; white on cheeks, pleura below, propodeum and legs, with dense white patches in front of and behind the wing bases; black on vertex, disc of mesonotum except anteriorly, and pleura above; mixed black and white on face, clypeus and scutellum; very short and inconspicuous on abdomen, largely pale, the segments with entire pale apical fasciae, segments five and six with erect black hairs, and segment six with a fine pale pruinosity in addition; scopa pale ochraceous, largely black on segment six.

Type.—Female; La Rioja, Argentina, [M. C. Z., no. 16208]. *Paratype.*—1 ♀; topotypical, [M. C. Z.].

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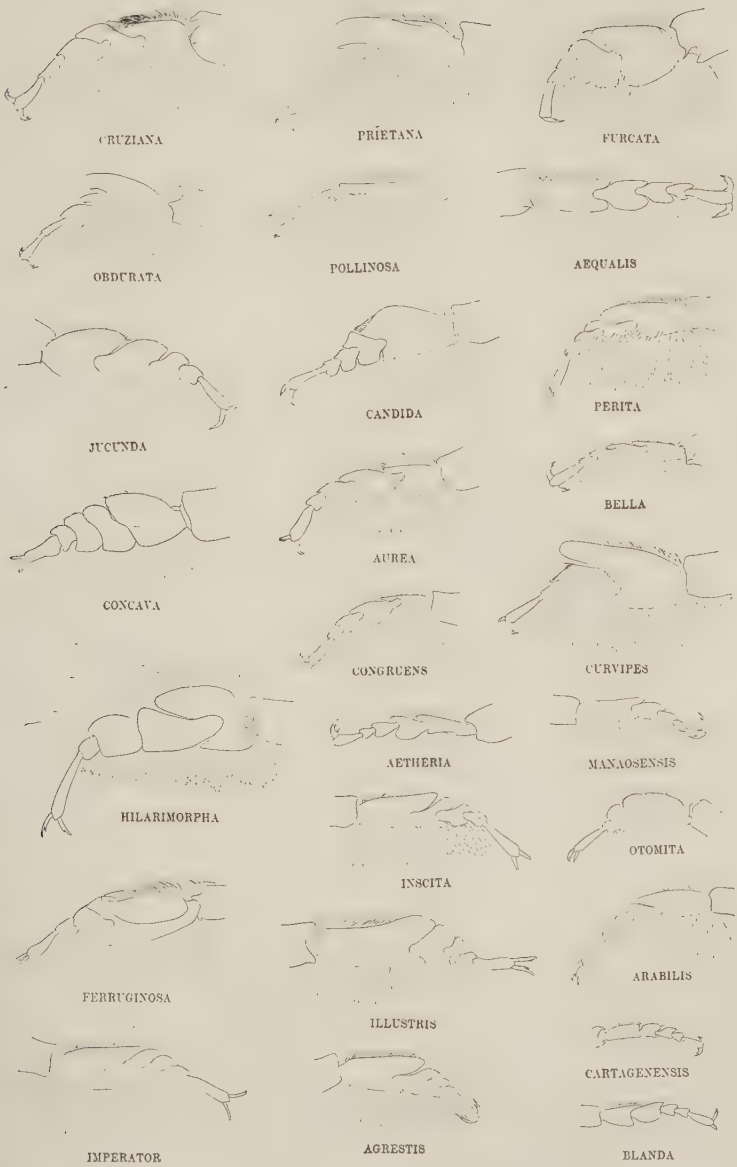
Plate XIII. Clypeus and mandibles of females.

Plate XIV. Clypeus and mandibles of females.

MITCHELL—NEOTROPICAL MEGACHILE



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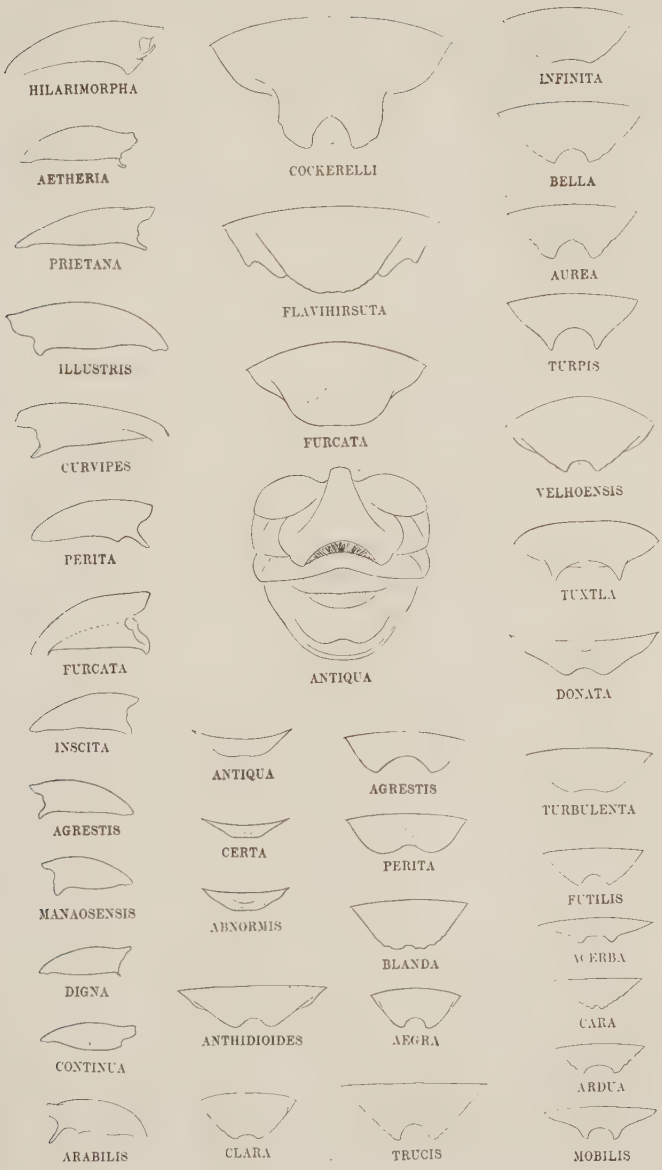

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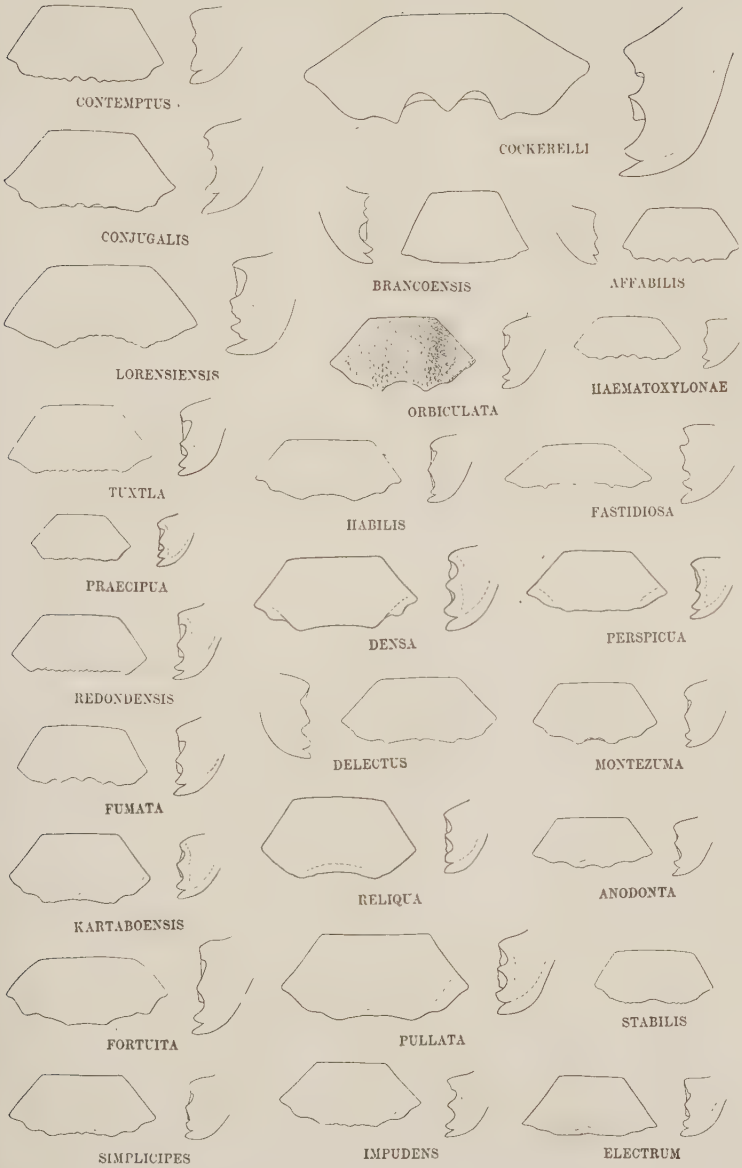

MITCHELL—NEOTROPICAL MEGACHILE

NOTES ON AND DESCRIPTIONS OF SOME NEOTROPICAL NERIIDAE AND MICROPEZIDAE

(DIPTERA)

BY EZRA T. CRESSON, JR.

This paper is the result of several years' interrupted study of these interesting families based on material mostly from Panama and the West Indies.

Previous to the appearance of Dr. Enderlein's "Klassifikation der Micropeziden"[1] these species were confined to one family consisting of *Nerius*, *Calobata*, *Micropeza* and several less known genera. This "Klassifikation," although contributing considerably to our knowledge of the family, falls far short of offering a logical or even a practical classification. Dr. Enderlein fortunately had much material, mostly from South America and the East Indies, which naturally contained many new forms, and which certainly should have given any careful student of this group an excellent opportunity to work up a nucleus of a practical classification, especially if he also had access to the European collections. Although his paper is entitled "Klassifikation der Micropeziden" little attention is given to the known Palaearctic and Nearctic species, and it is difficult to conceive of a classification that does not include the known species of those faunae. That the family is rich in forms may be gleaned from the fact that Dr. Enderlein finds thirty-one new genera and one hundred and thirty-five new species, most of which are probably valid. In the present paper I propose two new genera and twenty new species.

Judging from the characterization of many of his genera, it is evident that Enderlein failed to grasp the essential characters, so that even if most of the genera he proposed will prove to be tenable, they may not stand on any of the characters originally given; and in some cases an entirely different concept will have

[1] Archiv f. Naturg., 1922, A, Hft. 5, pp. 140–229, (1922).

to be formed in order to be consistent, or satisfied as to their validity. This condition gives much trouble especially if many of the included species, particularly the genotypes, are not found in the material at hand.

The "Klassifikation" does however offer considerable help in that it is fairly complete in collating the described species of the faunae treated, but in this respect care must be exercised, for there is a sad lack of proper bibliographical references to the species. Merely the date following the author's name is given, and the former is often wrong. This method of citation is merely suggestive, serving no other purpose, and necessitates much search for the original descriptions. Types of the new species are not designated, which is an acknowledged requisite these days. One may therefore glean from the above brief analysis of the "Klassifikation" that there is a strong reflection of superficiality.

The material before me, for the most part, is from Panama and the West Indies with a relatively small number from South America. A total of eleven hundred and fifteen specimens have been examined, representing ten genera and ninety-one species.

I take this opportunity to acknowledge my indebtedness to the following persons and institutions for privilege of studying their unnamed, and in some cases their named material. Dr. Jos. Bequeart [Bequaert], United States National Museum [U. S. N. M.] through Dr. J. M. Aldrich, the American Museum of Natural History [A. M. N. H.] through Dr. F. E. Lutz, Cornell University [Cornell] through Dr. J. C. Bradley and Mr. C. H. Curran, New York Academy of Sciences [N. Y. A. S.] and the New York Zoological Society [N. Y. Z. S.] through Dr. F. E. Lutz and Mr. C. H. Curran, the Canadian National Museum [Canada] through Mr. C. H. Curran, and Mr. R. H. Painter [Painter].

Prior to Enderlein's paper, Osten-Sacken was the most recent student to give a comprehensive treatment of this family, in his paper on Philippine Diptera.[2] With notes on the described genera and species, and descriptions of new forms, he gave us a very thorough review of this group, particularly noting the chaetotaxy. He considered the following genera as members of the family: *Calobata* Meigen, 1803, *Micropeza* Meigen, 1803,

[2] Berl. Ent. Zeit., xxvi, pp. 194–208, (1882).

Nerius Fabricius, 1805, *Longina* Wiedermann, 1830, *Taeniaptera* Macquart, 1835, *Cardiacephala* Macquart, 1843, *Grammicomyia* Bigot, 1859, *Telostylus* Bigot, 1859, *Anaeropsis* Bigot, 1866, *Calycopteryx* Eaton, 1875, *Nothybus* Rondani, 1875, *Nestima* Osten-Sacken, 1881 and a new genus *Eurybata.*

The position and limitation of these genera have been well established, with the exception of *Taeniaptera,* which has been confused with, or, not been considered sufficiently distinct to separate it from, *Calobata.* Osten-Sacken in the above mentioned paper uses the position of the posterior crossvein in relation to the end of the second vein, as the primary characteristics of these two genera. Hendel[3] uses the relative widths of the frontal orbits and the mesofrons. I find that *Calobata* is very unique in its genitalic characteristics and in the Micropeza-like head. Those genera allied to *Taeniaptera* have the sternopleural comb well developed and the head less produced post-orbitally. *Micropeza* stands alone in consequence of its elongate head and absence of the basal crossvein. Rondani's genera *Mimegralla, Grallopoda, Grallomyia* and *Grallopeza,* were established, *vide* Osten-Sacken, for the most part in the absence of specimens, merely upon comparisons of Macquart's defective figures of the venation. Consequently he, Osten-Sacken, did not consider them valid. With later inclusions, and the addition of *Tanypeza* Fallen, 1820, *Gobrya* Walker, 1860, *Seracea* Walker, 1860, *Paranerius* Bigot, 1886 and *Calobatella* Mik, 1898, we had a fairly well marked family. In 1903, Hendel[4] threw out *Tanypeza* but introduced *Chaetonerius,* and later,[5] another genus, *Gymnonerius.*

In a previous paper[6] I made a brief contribution to our knowledge of this family, paying particular attention to the variations in the genitalic structure of the species then before me. Later[7] I offered some suggestions for the subfamily divisions, based upon

[3] Wien. Ent. Zeit., XXII, p. 202, (1903).
[4] Wein. Ent. Zeit., XXII, p. 201, (1903).
[5] Suppl. Ent., II, p. 41, (1913).
[6] Trans. Am. Ent. Soc., XXXIV, p. 12, (1908).
[7] Ent. News, XXIII, p. 389–391, (1912).

the structure of the thorax, especially in the region of the sternopleura, and characterized some of the genera represented; but owing to the lack of sufficient material from more varied localities, I failed to form a proper concept of those groups. The two families, Neriidae and Micropezidae, Enderlein retains, as subfamilies but Hendel in 1922[8] raised them to full family rank, which latter treatment I follow in the present paper adhering for the most part to Enderlein's arrangement. In the Micropezidae I make several departures that seem necessary, and follow my own idea as to the sequence of the genera which, however, I must confess, do not satisfy. There is no doubt some dichotomous arrangement, but more thorough studies of all available material should be made before anything definite can be offered in this line.

Explanation of terms used.—In the study of this family, the unusual development of the sclerites of the head made necessary the adoption of several terms not generally used in dipterological taxonomy, and also made an apparent change in the meaning of several well understood terms. It has not been necessary, however, to create new terms, but the application of those I use may not in all cases be that as originally proposed, nor be familiar to most students. Consequently a brief explanation of these are here given, particularly those referring to the areas of head.

I have used the term *occiput* to refer to the entire region of the head posterior to the eyes; here we have the *paracephala* as the lateral portions of the occiput bordering the posterior orbits, and bearing the outer vertical bristles on their upper portion, and are there sometimes strongly tuberculous. Above and mesad of the paracephala and bearing the inner verticals and the posterior pair of frontal bristles, are the *epicephala*, which generally occupy the lateral angles of the vertex,[9] and extending posteriorly to the foramen and anteriorly as the *frontalia*, from which they are usually indistinctly differentiated. The latter (frontalia) are often very narrow or may be indeterminable, being in evidence

[8] Konowia, 1, p. 157, (1922).

[9] The term vertex in these families is not always definitely limited enough to use, but is here used to indicate that portion of the head between the eyes, including the vertical bristles.

only by the presence of the *anterior frontal bristles*. Between the epicephala and the frontalia may be seen the *mesofrons* as a comparatively broad or narrow, often fusciform, opaque, median stripe, including the *ocelli*, and extending more or less the entire length of the frons. Laterad of the mesofrons anteriorly are the *parafrons*, but not always differentiated, occupying the lateral anterior portion of the frons, generally extending posteriorly along the orbits to near the vertex. The other terms I have used are well known and need no explanations, and with those of the thorax may be determined by reference to the figures.

Fig. 1. Head.

Epicephala	Ec	Ocelli	Oc
Frontalia	F	Outer-verticals (bristles)	Ov
Frontals (bristles)	Fr	Paracephala	Pc
Inner-verticals (bristles)	Iv	Parafrons	Pf
Lunula	Lu	Postverticals (bristles)	Pv
Mesofrons	Mf		

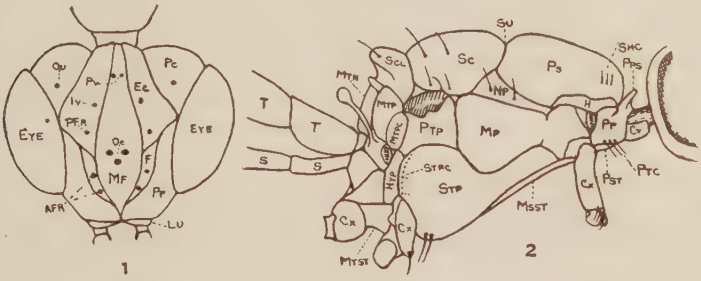

Fig. 2. Thorax.

Cervical	Cv	Propleura	Pp
Coxae	Cx	Propleural scale	Pps
Humeri	H	Proscutum	Ps
Hypopleura	Hyp	Prosternum	Pst
Mesopleura	Mp	Prothoracicals (bristles)	Ptc
Mesosternum	Msst	Pteropleura	Ptp
Mesonotum (includes the proscutum and scutum)		Scutellum	Scl
		Scutum	Sc
Metanotum	Mtn	Sternopleura	Stp
Metapleura	Mp	Sternopleural comb (bristles)	Stpc
Metapleural callus	Mtpc	Superhumeral comb (bristles)	Shc
Metasternum	Mtst	Suture	Su
Notopleura	Np		

Neriidae

I am following Hendel[10] and Fey[11] in giving this group family rank. This treatment seems justified when we consider the entirely different general morphology of the species belonging thereto, from those belonging to the Micropezidae in its more strict sense.

The species of this family are at once recognized by their slender build, augmented by the porect position of the antennae which have a finger-like prolongation of the inner side of the second segment, lying in a groove at the base of the third. The arista is apical or subapical; the thorax is considerably produced beyond the fore coxae, throwing the fore legs near the middle ones; and the mesofrons is broad anteriorly. The male genitalic organs are, externally, very much like those of the female, with the claspers subterminal on a ovipositor-like segment which can be folded beneath and against the venter.

There are several groups of genera which possibly deserve subfamily grouping, but the species treated in the present paper all fall in one, which may well be termined the Neriinae, the characters of which I will not attempt to indicate without a more thorough knowledge of species of the other faunae.

Longina vittatus (Wiedemann)

1830. *Nerius vittatus* Wiedemann, Ausseur Zweifl. Ins., II, p. 549. [♀].
1830. *Longina abdominalis* Wiedemann, Ausseur. Zweifl. Ins., II, p. 554. [♂].

The description of the female as *vittatus* has priority if the synonymy is correct. Enderlein quotes the synonymy but holds to *abdominalis*.

State of Sao Paulo, Brazil, (Hammar), [Cornell Univ.; Lot 998, Sub. 188; 1 ♀].

Bernardinao, Paraguay, (Fiebrig), [U. S. N. M., 2].

Both sexes are represented in the Paraguay material, but the male has the antennae missing. The female agrees with the description of *vittatus*.

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[10] Konowia, I, p. 157, (1922).
[11] Not. Ent., VII, p. 65, (1927).

Odontoloxozus longicornis (Conquillett)

1904. *Nerius longicornis* Coquillett, Proc. Ent. Soc. Wash., VI, p. 188.
1922. *Odontoloxozus punctulatus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 158.

This species is easily recognized by the white arista, long second antennal segment, the conspicuous black spines, and spinules on the thorax, which latter are more noticeable on account of the blackish dots at their bases.

Comparison of type material with Enderlein's description satisfactorily establishes the synonymy of *punctulatus*.

This species was originally described from Texas (type locality), Arizona, and California. Enderlein's material consisting of males only, was from Raecon, San Luis Potosi, Mexico. My material of three males and a female was collected at Higuito, Costa Rica, (P. Schild), [U. S. N. M.]. These latter range larger in size than those from the United States.

Glyphidops filosus (Fabricius)

1805. *Nerius filosus* Fabricius, Syst. Antl., p. 265.
1912. *Telostylus vittatus* Cresson, Ent. New, XXIII, p. 390.
1922. *Glyphidops filosus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 151.

I have no doubt of the synonymy of *T. vittatus* Cresson, the type of which is before me.

TRINIDAD: June, (Busck), [U. S. N. M., 2]. Montserrat, June, (Busck), [U. S. N. M., 4].

COSTA RICA: Higuito, (Schild), [U. S. N. M., 4]. Orotipe, December 20, (Alfaro), [U. S. N. M., 1].

GUATEMALA: La Providencia, Obispo, (Bouillard), [U. S. N. M., 2].

PANAMA: Barro Colorado, Canal Zone, July 18–24, (Banks), [M. C. Z., 2].

BRITISH GUIANA: Bartica, May 20, [A. N. S. P., 1]. Kartabo, August 9, [N. Y. Zool. Soc., 4].

BRAZIL: Rio de Janeiro, (Smith), [A. M. N. H., 1].

Dictyonerius pluricellatus (Schiner)

1868. *Nerius pluricellatus* Schiner, Reise Novara, Zool., II, p. 248.
1922. *Dictyonerius pluricellatus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 159.

This species is very interesting in its peculiar venation and wing maculation which is well described by Schiner. It was originally described from "Sud Amerika" but there seems little doubt as to the determination of the two females before me from

Higuito, Costa Rica, (Pablo Schild), [U. S. N. M.]. In addition to the original description, the following characters are noteworthy: Vertex with a lateral callus bearing the inner and outer verticals; frontal orbit with two black spots; face with one orbital spot, and median area somewhat darkened beneath antennae; postorbital area with two quadrate black spots. Abdomen with pruinescent bases to the segments.

NERIUS Fabricius

1805. *Nerius* Fabricius, Syst. Antl., p. 264.
1922. *Cerantichir* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 155.
1922. *Brachantichir* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 156.

GENOTYPE: *Nerius pilifer* Fabricius, 1805. [Coquillett, 1910].

Cerantichir was based on *Nerius flavifrons* Bigot, 1886, which is congeneric with *N. pilifer* Fabricius. *Brachantichir* was based on a new species, *robusta*, which is also congeneric with *pilifer*.

I do not agree with Enderlein's conception of this genus. As here recognized the species have the arista bare, dark, with whitish base; fore femora stout and strongly spinose beneath, at least apically.

This is, as far as known, a neotropical genus, but has been the recipient of most of the Neriinae described by previous authors from other faunae.

Nerius pilifer Fabricius

1805. *Nerius pilifer* Fabricius, Syst. Antl., p. 264.
1830. *Nerius pilifer* Wiedermann, Ausseur. Zweifl. Ins., II, p. 550.

I am guided by Wiedermann, who probably saw Fabricius' material, in the determination of this species. I do not understand Enderlein in stating that the fore femora are not spined, but merely setulose. The species seems to be a well represented neotropical one and agrees well with the descriptions of Fabricius and Wiedermann.

There is much similarity between this species and *robustus* as here recognized, but the series at hand, on comparison, show the following differences: *Pilifer* is smaller, five to nine mm. long, excluding the arista and genital segments; the median mesonotal stripe broader, sometimes divided medianly by a fine brown line, but with no other postsutural division; pleura more opaque and evenly pruinose, with at most a faint pale humeral stripe.

COSTA RICA: Higuito, San Mateo, (P. Schild), [U. S. N. M., 12].

PANAMA: Alhajuelo, Canal Zone, May 21, (A. Busck), [U. S. N. M., 2 ♀]. Ancon, Canal Zone, February 19, (Zetek), [U. S. N. M., 3]. Barro Colorado, Canal Zone, June to August, (Banks), [M. C. Z., 14]. Tabernilla, Canal Zone, July, (A. Busck), [U. S. N. M., 1 ♂].

HAITI: Santo Domingo, August 15, (A. Busck), [U. S. N. M., 1 ♀].

BRITISH GUIANA: Kartabo, August to September, [N. Y. Zool. Soc., 2].

BRAZIL: Chapada, December, (H. H. Smith); Corumba, April, (H. H. Smith), [A. M. N. H., 2 ♀]. Sao Paulo, (A. Lutz), [U. S. N. M., 1 ♀].

PARAGUAY: San Bernardino, (Fiebrig), [U. S. N. M., 2 ♂, 2 ♀].

A male from Barro Colorado has the third antennal segment much broader at its apex than at the base, but is apparently identical with the remainder of the series in other respects.

Nerius robusta (Enderlein)

1922. *Brachantichir robusta* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 157.

This species was originally described from Eastern Bolivia, and Peru. I do not think my determination of the material before me is erroneous. These specimens are certainly congeneric with *N. pilifer* Fabricius, and which fact results in the synonomy of *Brachantichir*.

The individuals of this species are larger than those of *pilifer*; the gray mesonotal stripe is divided by a broad, brown median line, which again divides into two more stripes behind the suture. Pleura more shining, with some irregular gray markings; the pale humeral stripe is distinct and gray, extending to base of wings.

MEXICO: Cordoba, January 31, (F. Knab), [U. S. N. M., 1].

GUATEMALA: Cacao Trece Aguas, Alta Vera Paz, April 22, (Schwarz & Barber), [U. S. N. M., 1]. La Providencia, Obispo, April 15, (Aldrich), [U. S. N. M., 1].

COSTA RICA: Higuito, San Mateo, (P. Schild), [U. S. N. M., 3].

PANAMA: Porto Bello, March 13, (A. Busck), [U. S. N. M., 1]. Barro Colorado, Canal Zone, June to August, (Banks), [M. C. Z., 10].

HAITI: Santo Domingo, August (A. Busck), [U. S. N. M., 4]. San Francisco Mountains, September, (A. Busck), [U. S. N. M., 2].

TRINIDAD: June, (A. Busck), [U. S. N. M., 4]. Montserrat, June, (A. Busck), [U. S. N. M., 9].

BRITISH GUIANA: Bartica, May 10, [A. N. S. P., 1].

Nerius flavifrons Bigot

1886. *Nerius flavifrons* Bigot, An. Soc. Ent. Fr., (6), VI, p. 373.
1897. *Nerius flavifrons* van der Wulp, Biol. Cen.-Am. Dip., II, p. 364, pl. 9, fig. 16.
1922. *Cerantichir flavifrons* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 155.

Enderlein erected the genus *Cerantichir* on a species with white, pubescent arista, which he considered *Nerius flavifrons* Bigot (1886). Bigot's description, however, calls for "chete brun a base blanche" which at once eliminates Enderlein's specimens. The species Enderlein had before him as *flavifrons* is certainly not congeneric with *pilifer*, and furthermore, cannot belong to his new genus *Cerantichir*, the type of which he specifically cites as "C. flavifrons (Big., 1886)." We therefore have no alternative but to consider this genus synonymous with *Nerius* as long as *flavifrons* is considered congeneric with *pilifer*. The specimens before me agreeing with Bigot's description are certainly congeneric with *Nerius pilifer*.

In this species we have the antennae, palpi and legs pale, pleura more or less darkened but the metapleural callus always pale; knob of halteres pale; legs with median and subapical rings on femora and apices of tibiae, sometimes very indistinct; tarsi dark.

GUATEMALA: La Providencia, Obispo, (Rouillard), [U. S. N. M., 1].

NICARAGUA: San Mareos, (Baker), [U. S. N. M., 1 ♂; determined by Coquillett].

PANAMA: February to March, (on fruit), [A. M. N. H., 3]. Alhajuelo, April 16–17, (A. Busck); Ancon, Canal Zone, October 11, (L. H. Dunn; from rotting calabash); Tabernilla, Canal Zone, July 24, (A. Busck); [all U. S. N. M., 4]. Barro Colorado, Canal Zone, July 12 and 26, (Banks), [M. C. Z., 11].

COSTA RICA: Higuito, San Mateo, (P. Schild), [U. S. N. M., 16].

TRINIDAD: June, (A. Busck); Montserrat, June 30, (A. Busck); [all U. S. N. M., 3].

COLOMBIA: Haciendo Cincinnati, Sierra San Lorenzo, Madalena, July 14, (Rehn & Hebard), [A. N. S. P., 1].

BRITISH GUIANA: Kartabo, August 17, [N. Y. Zool. Soc., 1].

Nerius dispar Cresson

1926. *Nerius dispar* Cresson, Trans. Am. Ent. Soc., LXII, p. 261.

Porto Bello, Panama, March 13, (Busck), [U. S. N. M.; type].

Nerius durus Cresson

1926. *Nerius durus* Cresson, Trans. Am. Ent. Soc., LXII, p. 260.

Higuito, Costa Rica, (Schild), [U. S. N. M.; type].

Another female is before me from the same locality, and is apparently identical but the legs are darker, not showing the annulation so markedly; the wings have the infuscation at the tip of second vein only.

MICROPEZIDAE

The species of this family have the antennae decumbent, without the mesal finger on the second segment and a subbasal arista. The prothorax is retracted while the mesothorax is extended, so that the fore and middle coxae are widely separated. The genitalia of the male is radically different from that of the Neriidae in that the claspers are removed towards the base of; the abdomen, apparently situated beneath one or more of the intermediate abdominal segments, assuming a variety of shapes, and greatly developed in some of the Calobatini.

As this family is well represented in North and South America, I have attempted to group the genera into subfamilies.

Subfamily TAENIAPTERINAE

I adopt this name for the subfamily containing those genera which form a group quite distinct from those allied to *Micropeza* and *Calobata*. Enderlein calls it the Calobatinae while Fey restricts that name more correctly to another group, using Tanypodinae for the present one.

There are several tribes which I will not attempt to define at this writing. The characteristics of this subfamily may be diagnosed as follows:

Hind and middle tibiae with distinct extensor setulae or bristles (except *Tenthes citatus* n. sp.); hind tarsi without basal flexor fascicle; sternopleural comb well developed, of numerous bristles; anal cell at least as long as width of cell and generally much longer than ultimate section of sixth vein.

RAINIERIA Rondani

1843. *Rainieria* Rondani, N. Ann. Sci. Nat., Bologna, x, p. 40. [Genotype, *Calobata calceata* Fallen].
1856. *Tanipoda* Rondani, Dipt. Ital. Prod., I, p. 116. [Genotype, *Calobata calceata* Fallen].
1864. *Tanypoda* Schiner, Faun. Austr., II, p. 192. [Emendation].
1926. *Rainieria* Cresson, Trans. Am. Ent. Soc., LII, p. 268.
1922. *Tanypoda* Enderlein, p. pt., Arch. f. Naturg., 1922, A, Hft. 5, p. 197.
1927. *Tanypoda* Frey, Not. Ent., VII, p. 70.

It is difficult to satisfactorily characterize this genus, especially when *Systellapha* and probably *Grallopeza* are considered. I do not know the latter. We here realize our insufficient acquaintance with the characteristics of the groups of this subfamily to more intelligently establish their limits and designate them as genera. Various authors have used different characters for their separation, as for instance: the amount of apical convergence of the third and fourth veins, the amount of plumosity or pubescence of the arista and the amount of dilation of the palpi. I have not been able to use these except in correlation with other characters.

At present I am following Enderlein and Frey in restricting this genus to those species with bare or pubescent arista, placing those with distinctly plumose arista in *Systellapha*. We therefore characterize *Rainieria* as follows:

Vertex normal, not conically tuberculose; all four verticals present; palpi broad. Sternopleural comb of numerous bristles (more than five); metapleura callus normal, turgid, not conically produced. Hind tibiae with flexor setae. Third costal section nearly as long as ultimate section of fourth vein; basal crossvein present; anal cell short but acute.

Rainieria baracoa (Cresson)

1926. *Systellapha baracoa* Cresson, Trans. Am. Ent. Soc., LII, p. 265.

The arista here is bare or pubescent basally, and the species is therefore placed in this genus.

CUBA: Baracoa, September, (Busck), [U. S. N. M., 4; type series]. Cayamas, May 24, (Schwarz), [U. S. N. M., 1].

Rainieria nebulosa (Loew)

1866. *Calobata nebulosa* Loew, Berl. Ent. Zeit., x, p. 48. (Cent., VIII, 89.)

The following diagnosis was drafted from specimens compared with the type:

Yellow to tawny; clypeus, fore femora, tibiae, and abdomen dark; middle and hind tibiae mostly dark; base of all tarsi white; apex of male tarsi not dilated; middle and hind femora with faint subapical brown ring. Thorax unicolorous, pale in contrast with the abdomen; sixth abdominal segment of both sexes enlarged, swollen, broader than fifth. Arista bare or pubescent basally. Wings hyaline at most, with faint discal cloud.

This species was originally described from Florida. I have seen specimens from that State, but only the following from more southern localities. It probably occurs throughout the West Indies, but not on the mainland of Central and South America.

CUBA: Cayamas, March, (Schwarz), [U. S. N. M., 1].

Rainieria gilvimana Cresson

1926. *Rainieria gilvimana* Cresson, Trans. Am. Ent. Soc., LII, p. 269.

PANAMA: Barro Colorado, Canal Zone, June 20 to August 20, (N. Banks), [M. C. Z., 6]. Alajuela, March 12, (A. Busck), [U. S. N. M., 7; type and paratypes]. Trinidad Rio, March 29, (A. Busck), [U. S. N. M., 3].

COSTA RICA: Higuito, (Schild), [U. S. N. M., 2].

REPUBLIC OF HONDURAS: Sangrelaya, April 13, (Bequaert), [Bequaert, 1].

Rainieria bracteata (v. d. Wulp)

1897. *Calobata bracteata* v. d. Wulp, Biol. Cent.-Am., Dip., II, p. 371, pl. 9, fig. 23.

1922. *Systellapha bracteata* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 189.

The specimens before me agree so well with the original description and figure of this species, that I do not doubt my determination. I cannot, however, reconcile van der Wulp's description of the "front with two shining bluish black spots" unless he is referring to the metallic tinged angles of the vertex. The infuscation of the wings is more extensive than is figured, but otherwise I can see no conclusive characters to the contrary.

The specimens before me are from Sangrelaya, Republic of Honduras, [Bequaert, 1], and La Providencia, Obispo, Guatemala, [U. S. N. M., 1].

Rainieria tritaeniolata (Enderlein)

1922. *Tanypoda tritaeniolata* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 206.

This species was originally described from two males from Mexico and Costa Rica. A female before me labeled "Mexico,"

not in first class condition, differs from Enderlein's description of the male in having the bases of the middle and hind femora black.

Rainieria alternata Cresson

1926. *Rainieria alternata* Cresson, Trans. Am. Ent. Soc., LII, p. 268.

In this species we have the head very dark ferruginous to brown, with the mesofrons almost black; the shining surfaces of the body metallic blue; femora entirely black without any discernable subapical band.

PANAMA: Porto Bello, February 23, (A. Busck), [U. S. N. M., 1 ♂; type]. Barro Colorado, Canal Zone, June 23, (N. Banks), [M. C. Z., 1].

Rainieria uda new species

Very similar to *R. alternata* Cresson, but head unicolorous, ferruginous, the large mesofrontal area not darker, and the middle and hind femora with distinct but not sharply defined pale subapical rings.

Black; head and members, foramen and neck sclerites, ferruginous. Subapical oblique rings on all femora, yellowish but not sharply defined; three basal segments of fore tarsi, first segment of middle tarsi and first two of hind tarsi, white; apices of fore tarsi, yellow. Wings hyaline with a faint subbasal, a broad median and a faint apical, brown band. Parafacials silvery with two velvety black reflecting spots. Thorax faintly metallic blue, overcast with gray, especially above, but with a brown to black, almost opaque, sutural band. Scutellum blackish, opaque above; pleura and abdomen more shining, second to fourth segments of latter with median brownish bands.

Frons one-third width of head; mesofrons one-half width of frons; ocellar tubercle at middle of broadest part of mesofrons, just anterior to line of posterior frontal bristles. Parafrons and lunula shining, but somewhat wrinkled. Mesonotum with series of minute black setulae. Anal crossvein about one-half as long as ultimate section of sixth vein. Tibiae distinctly dilated and sulcate. Claspers of male with short, stout, bristly fingers, strongly curving mesally, and with minute black granulations on inner surfaces. Length, 8 to 9 mm.

Type.—Female; Sangrelaya, Republic of Honduras, April 30, 1924, (J. Bequaert), [A. N. S. P., no. 6378].

Paratypes.—1 ♂; topotypical, April 13, 1924. 2 ♀; Corocito, April 3, 1924. 1 ♀; Puerto Castilla, March 26, 1924. All Republic of Honduras, (J. Bequaert).

Rainieria pleuralis new species

Differing from any South American species of this genus known to me, by the pale middle and hind femora. The pleura is ferruginous, contrasting with the black mesonotum.

Mostly black. Parafacials, proboscis, lower occiput, antennae, humeri, pleura for the most part, middle and hind coxae and all tibiae, ferruginous to tawny. Parafrons, spot between antennae, fore coxae, basal half of fore femora, middle and hind femora and ovipositor segment, tawny to yellow. Fore tarsi and basal two segments of hind tarsi, white. Apical half of fore femora and all of fore tibiae, black. Distomedian and subbasal rings, subapical extensor spot on middle and hind femora, brown. Wings yellowish with faint median and apical areas brown.

Frons one-half as broad as head; mesofrons one-half as broad as frons, opaque, velvety black and slightly convex anteriorly, narrowly attaining anterior margin, attenuating and then dilating posteriorly, broadest anterior to ocelli, which latter are just anterior to line of posterior frontal bristles. Paracephala, parafacials and clypeus, polished. Third antennal segment ovate; arista bare. Mesonotum subopaque, black, with yellowish gray overcasting, but with a broad brown median stripe. Pleura with two oblique faint yellowish silvery bands above middle and hind coxae; sternopleura also reflecting some silver. Tibiae slender, not grooved. Anal cell acute, its crossvein about one-half as long as ultimate section of sixth vein. Third costal section almost as long as ultimate section of fourth vein. Length, 9 mm.

Type.—Female? (abdomen beyond second segment missing); Vista Nieve, San Lorenzo Mountains, Colombia, December 22, 1922, (H. L. Viereck), [A. N. S. P., no. 6386].

Paratypes.—1 ♀; topotypical. 1 ♀; topotypical, December 16, 1922, [Can. Nat. Mus.].

SYSTELLAPHA Enderlein

1922. *Systellapha* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 189.

As I have stated under Rainieria, the separation of the present genus is based on the plumosity of the arista. I have not seen the genotype, *Systellapha ornatithorax* Enderlein, but my *S. pulchrifrons* is apparently very closely allied. Using the latter as a typical species, I would suggest an entirely different generic concept from that which I am here considering; but such treat-

ment would eliminate a few species which apparently have no other generic position, and I am reluctant to propose a new genus in this group at present for their reception.

As here recognized the genus contains those species having a distinctly plumose arista and slender, ungrooved or weakly grooved, tibiae. The head and thorax of the species known to me are ferruginous or tawny.

Systellapha pulchrifrons Cresson

1926. *Systellapha pulchrifrons* Cresson, Trans. Am. Ent. Soc., LII, p. 267.

The following localities are also represented in the material studied:

COSTA RICA: Higuito, San Mateo, (Pablo Schild), [U. S. N. M., 3]. San Carlos, (Schild & Burgdorf), [U. S. N. M., 1].

PANAMA: Trinidad Rio, March 18, (Busck), [U. S. N. M., 20; typical series].

COLOMBIA: Aracataca, Magdalena, August 10, (Rehn), [A. N. S. P., 1].

BRITISH GUIANA: Kalacoon, Bartica District, [N. Y. Z. S., 2].

The following variations are noteworthy: A female from Grenada, West Indies, June 9, (A. Busck), [U. S. N. M.], has the rings on the hind femora very broad and distinct; another female from Trinidad, June 20, (A. Busck), [U. S N. M.], has similar broad femoral rings with the addition of an anterior flexor spot just beyond middle.

Systellapha panamaensis Cresson

1926. *Systellapha panamaensis* Cresson, Trans. Am. Ent. Soc., LII, p. 269.

PANAMA: Alajuela, Panama, April 7, 1911, (A. Busck), [U. S. N. M., 2; type and paratype]. Barro Colorado, Canal Zone, July 24, (N. Banks), [M. C. Z., 1].

REPUBLIC OF HONDURAS: Corocito, March, (Bequaert, 5]. Puerto Castilla, May 6, (Painter), [Painter, 1].

COSTA RICA: Higuito, (Schild), [U. S. N. M., 2].

Systellapha cristulata Cresson

1926. *Systellapha cristulata* Cresson, Trans. Am. Ent. Soc., LII, p. 265.

CORDOBA, Mexico, April 5, (Knab), [U. S. N. M., 2; typical series].

Systellapha footei Cresson

1926. *Systellapha footei* Cresson, Trans. Am. Ent. Soc., LII, p. 266.

DOMINICA, June to July (Foote), [U. S. N. M., 3; typical series].

Systellapha placida (Loew)

1866. *Calobata placida* Loew, Berl. Ent. Zeit., x, p. 49. (Cent., vii, 90.)

Yellow to ferruginous; abdomen inclined to dark metallic blue; more or less of apical three-fourths of fore femora, and fore tibiae, brown; middle and hind femora immaculate, at most with faint infuscation at apex. Wings with large median cloud. Superhumeral comb of one to several setuale; arista plumose; sixth abdominal segment not noticeably enlarged.

This species was originally described from Cuba, the type, a female, I have seen in the Museum of Comparative Zoology.

Cuba: Baracoa, September, (Busck), [U. S. N. M., 2]. Estacion Cent. Agr. de Cuba, December 31, [U. S. N. M., 1]. Guantanams, San Carols Estate, October 4–8, [A. M. N. H., 4] Havana, (Baker), [A. N. S. P., 8].

Santo Domingo: Sanchez, May 22–27 [A. M. N. H., 1]. San Francisco Mountains, September, (Busck), [U. S. N. M., 4].

Haiti: No data, [A. N. S. P., 1].

Costa Rica: No data, [A. N. S. P., 2].

Systellapha placidoides Cresson

1926. *Systellapha placidoides* Cresson, Trans. Am. Ent. Soc., lii, p. 265.

Castries, St. Lucia, Lesser Antilles, September, 10–22, (Bradley), [Cornell, 1; type].

Systellapha cantata Cresson

1926. *Systellapha cantata* Cresson, Trans. Am. Ent. Soc., lii, p. 266.

Boa Vistado Jaquiri, Rio Teffe, Brazil, September 5, [Cornell, 1; type].

Systellapha spinuliger Cresson

1926. *Systellapha spinuliger* Cresson, Trans. Am. Ent. Soc., lii, p. 267.

Dominica, Lesser Antilles, June to July, (Foote), [U. S. N. M., 1; type].

Systellapha flavicauda Cresson

1926. *Systellapha flavicauda* Cresson, Trans. Am. Ent. Soc., lii, p. 266.

Montserrat, Lesser Antilles, [U. S. N. M., 1; type].

Systellapha scurra Enderlein

1922. *Systellapha scurra* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 191.

This species is distinguished by having the frons without any black except at the ocelli, the apices of middle and hind femora being black, and the presence of but one dorsocentral. It is a very distinct species, but I doubt if it is congeneric with the genotype.

The species was originally described from Porto Rico and I have examined specimens from the following localities.

PORTO RICO: Cayey, May; Mayguez, July; Naranjito, July; Adjuntas, June; [all N. Y. Z. S., 16]. Mayaguez, February and July, (R. H. Van Zwalenburg), [U. S. N. M., 8].

CLIOBATA Enderlein

1923. *Cliobata* Enderlein, Deut. Ent. Zeit., 1923, p. 540.

Enderlein separates this genus from *Scipopus* on the closing and petiolation of the first posterior cell, and designates *Calobata guttipennis* Wiedemann (1830) as the type species. I cannot accept this character alone, in fact I do not consider it of any generic importance. The genus, however, seems to be available for those species included in *Scipopus* by Enderlein, having maculate wings, which are not congeneric with *Calobata erythrocephala* Fabricius. In addition to the above we may consider the development of the epicephala which are contiguous behind the ocellar tubercle. The species are distinguished from those of *Rainieria* by their larger size, longer and more slender build.

Cliobata guttulipennis (Enderlein)

1923. *Scipopus guttulipennis* Enderlein, Deut. Ent. Zeit., 1923, p. 541.

The specimens before me agree with Enderlein's description of the type from Santa Catherina, Brazil, and are apparently congeneric with *Calobata guttipennis*, which latter, however, I have not seen.

The pale apical part of the basitarsus will separate the present species from *guttipennis*.

BRAZIL: Sao Paulo, (Hammer), [Cornell; 3].

Mesoconius infestus Enderlein

1922. *Mesoconius infestus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 179.

PERU: Rio Charape, September, (Townsend). Piches and Perene Valleys; [all U. S. N. M., 2].

SCIPOPUS

1922. *Scipopus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 208.

GENOTYPE: *Calobata erythrocephala* Fabricius (1805). [Original designation].

This is a Neotropical genus of large, dark, species with rather uniformly blackened wings, without any indication of bands, but the infuscation is generally more intense towards the costa; third costal section and anal cell short. The mesofrons broad behind ocellar tubercle.

The species with banded or maculate wings, originally included by Enderlein, are all probably members of other genera, at least one has since been removed by Enderlein to *Cliobata*.

The character of the sides of the frons above (epicephala), whether polished or opaque, seems to be of some value, but whether it is pale or dark is merely a matter of degree, and this color condition probably applies to the clypeus as well; while the color of the palpi seems to be quite stable. Enderlein does not appear to recognize the polished or opaque condition of the epicephala, although in his key to the species he mentioned the "Scheitelseiten poliert glatt schwarz" in one category in contradistinction to the same being "rotlich rostgelb oder rostbraunlich," making no mention of the opaque condition we find in *erythrocephala* and *diversa*, nor does he enlighten one in this respect in his descriptions. Is it possible he did not have any species showing this part being opaque. In which case my determinations of *erythrocephala* and *diversa* do not agree with his, and in other respects, I am quite sure we do not agree as regards the former species.

Scipopus erythrocephala (Fabricius)

1805. *Calobata erythrocephala* Fabricius, Syst. Antl., p. 260.
1830. *Calobata erythrocephala* Wiedemann, Ausseur. Zweif. Ins., II, p. 532.
1922. *Scipopus penicillus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 211.

The status of this species seems to be somewhat doubtful. The original description calls for the head, yellow; no mention being made of any discoloration of the clypeus, which surely would have been noticed if it was black. Wiedemann also, does not mention this fact, but Schiner,[12] van der Wulp,[13] and Enderlein[14] describe the clypeus as shining black. I do not

[12] Reise Novara, Zool., II, p. 250, (1868).
[13] Biol. Cant. Amer., Dip., II, p. 369, (1897).
[14] Arch. f. Naturg., 1922, A, Hft. 5, p. 210, (1922).

think these latter references apply to *erythrocephala* and although I do not consider the color of the clypeus alone a good specific character, none of the specimens I have seen of this species have the clypeus dark.

Black, with head including antennae, palpi and clypeus, yellow to orange; base of hind tarsi pale with white pubescence, of fore tarsi pale beneath, of middle tarsi entirely black; epicephala opaque not differentiated from the mesofrons; mesonotum somewhat whitish pruinose except a broad anterior median blackish stripe; sternopleura largely brown pruinose below. Length, 10–12 mm.

VENEZUELA: Rio Mato, Caura District, October, (Carriker), [U. S. N. M., 1].

BRITISH GUIANA: Bartica, May 15 and 22, (Crew), [A. N. S. P., 2]. Kartabo, March to August, [N. Y. Z. S., 4]. West bank, Demerara River, February 9, [N. Y. Z. S., 1].

Scipopus diversa (Schiner)

1868. *Calobata diversa* Schiner, Reise Novara, Zool., II, p. 250.
1922. *Scipopus diversus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 211.

This species is similar to *erythrocephala* but with the clypeus and palpi, black; mesonotum obscure bluish, without noticeable stripes; sternopleura dark pollinose below; fore tarsi with first and second segments white.

Van der Wulp reports the species from Mexico, Guatemala and Costa Rica,[15] and Enderlein records it from Colombia, Bolivia and Brazil, but I have seen it only from British Guiana.

BRITISH GUIANA: Bartica, May, (Crew), [A. N. S. P., 3]. Kartabo, Bartica District, September 2, [N. Y. Z. S., 2]. Kalacoon, Bartica District, [N. Y. Z. S., 1]. Kamakusa (Lang), [Bequaert, 1]. Tropical Research Station of New York Zoological Society, [N. Y. Z. S., 4]

Scripopus cartaboensis Cresson

1926. *Scipopus cartaboensis* Cresson, Trans. Am. Ent. Soc., LII, p. 270.

BRITISH GUIANA: Kamakusa, (Lang), [Bequaert, 1]. Kartabo, Bartica District, March 17, [N. Y. Zool. Soc., 2; typical series].

Scipopus belzebul (Schiner)

1868. *Calobata belzebul* Schiner, Reise Novara, Zool., II, p. 251.
1922. *Scipopus belzebul* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 210.

Until the type is critically studied we cannot determine the exact status of this species. Enderlein restricts the name to

[15] Biol. Cent. Amer., Dipt., II, p. 369, (1897).

those species falling within this genus, having black fore tarsi, polished black epicephala, yellow mesofrons, and black clypeus. Before me are two evidently distinct forms satisfying both Schiner's and Enderlein's descriptions; one from South America, the other from Central America. As the species was originally described from the former locality, I am restricting it to the form I have from localities in South America. As thus determined we may diagnose this species as follows:

Black including all tarsi; with mesofrons, and face, orange to tawny; antennae ferruginous; epicephala black to brown, shining, metallic tinged. Pubescence of tarsi black above; mesonotum brown and black pollinose at most slightly whitish laterally; sternopleura mostly brown pollinose with some white dusting behind fore coxae. Head in profile rather longer than high, its height at vertex greater than at antennae; frons and upper margin of eyes flattened, horizontal; the former anteriorly, and face, protruding beyond orbital profile. Paracephala strongly subconically convex at outer verticals; mesofrons rather sharply angled with epicephala at the postverticals. Claspers of male with, at most, minute basal prongs.

Enderlein records this species from Colombia, Surinam, and Brazil. I have the following records:

British Guiana: Kamakusa, September, (Lang), [Bequaert, 3].

Peru: El Oriente, Putamayo District, August, (Cornell University Expedition), [Cornell, 1]. La Cnoreria, Putamayo District, August, (Cornell University Expedition), [Cornell, 1].

Brazil: Above Santarem, July 22, [Bequaert, 1]. Ypiranga River, Ica-Putamayo, August, (Cornell University Expedition), [Cornell, 1]. No locality, (Merrill), [A. N. S. P., 1].

Scipopus frit Cresson

1926. *Scipopus frit* Cresson, Trans. Am. Ent. Soc., LII, p. 270.

This species is very similar to *belzebul* but the head is more rounded in profile, not vertically shorter at antennae; not noticeably horizontal above, and frons not much produced anteriorly. Paracephala turgid, but not conically developed; mesofrons not sharp at postverticals. Mesonotum more varied with gray especially as a median stripe; sternopleura mostly whitish but sometimes brownish below. Claspers of male with basal prong about one-half as long as the fingers.

GUATEMALA: Quirigua, May 7, (Aldrich), [U. S. N. M., 3].

HONDURAS: Corocito, April 3, [Bequaert, 4; paratypes]. Puerto Castilla, May 6, (Painter), [Painter, 1]. Sangrelaya, April 13, [A. N. S. P. and Bequaert, 6; type and paratypes].

COSTA RICA: San Carlos, [U. S. N. M., 1]. Turrialla (Schild & Burgdorf), [U. S. N. M., 3].

Scipopus limbativertex Enderlein

1922. *Scipopus limbativertex* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 211.

In this species as I understand it, we have the epicephala dark, polished; clypeus, and palpi, black; mesonotum with a broad bluish median line, sometimes scarcely discernable; sternopleura white pollinose with a pectal stripe of brown; first segment of fore and hind tarsi white and white pubescence.

The species was originally described from Mexico, Colombia, and Brazil, with no indication of the type locality. I have seen it only from Central America, and suspect that it may be the same species Schiner and van der Wulp determined as *erythrocephala*.

Of this species I have seen the thirty-three specimens from the following localities:

MEXICO: Cordoba, (Knab), [U. S. N. M.].

GUATEMALA: Quirigua, May 7, (Aldrich), [U. S. N. M.]. Trece Aguas, Alta Vera Paz, April, (Barber & Schwarz), [U. S. N. M.].

COSTA RICA: Higuito, San Mateo, (Schild), [U. S. N. M.]. San Carlos, (Schild & Burgdorf), [U. S. N. M.]. Tucurrique, (Schild & Burgdorf), [U. S. N. M.]

PANAMA: Ahajuela, April 18, (Busck); Cabina, April 17, (Busck); Porto Bello, March 3, (Busck); Trinidad Rio, March 23, (Busck); [all U. S. N. M.]. Barro Colorado, Canal Zone, July 3 to 30, (Banks), [M. C. Z., 3].

Scipopus opacus Enderlein

1922. *Scipopus opacus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 212

In this species we have the epicephala polished, the sternopleura dark pollinose, and the base of fore tarsi white. Originally described from Peru and Guatemala.

MEXICO: No locality, [A. N. S. P., 2].

GUATEMALA: La Providencia, Obispo, (Rouillard), [U. S. N. M., 1].

Scipopus melaneuris Cresson

1926. *Scipopus melaneuris* Cresson, Trans. Am. Ent. Soc., LII, p. 271.

Dominica, Lesser Antilles, June to July, (Foote), [U. S. N. M., 1; type].

MITROMYIA new genus

Allied to *Rainieria* but readily separated by the peculiar development of the head at the vertex. Suggesting *Cardiacephala* and *Mimomyrmecia* Frey (1927), erected for an Oriental species, in this respect, but certainly distinct from these genera.

Head higher than long; eyes vertical. Frons oblique, much longer than the face, strongly sculptured; vertex with two large tubercles bearing the inner vertical bristles, with a deep cleft between occupied by the postverticals; outer verticals not on tubercles. Ocelli on a pronounced tubercle near center of frons. Face broader than long. First and second antennal segments short; third three times as long as second, three times as long as broad, rounded apically; arista bare. Palpi broadly truncated apically, setulose. Thorax higher than long; humeri without bristle; one dorsocentral, posteriorly; sternopleural comb dense, of numerous long bristles. Metapleura turgid. Scutellum with two, apical, bristles. Second abdominal segment much longer than first. Male claspers simple. Legs slender; middle and hind femora without apical flexor series of setulae. Wing markings consisting of three infuscated areas or bands, similar to *Calobata munda* van der Wulp (1897). Third costal section nearly as long as ultimate section of fourth; anal cell pointed, with the extension about equal to width of cell; the anal crossvein about as long as ultimate of sixth.

I hesitate to propose this new genus but cannot satisfactorily place the following species in any known to me. In its tuberculose vertex there is a strong suggestion of *Mimomyrmecia* Frey, but the relatively shorter second abdominal segment as well as the difference in the structure of the head and other less conspicuous characteristics, as well as its different distribution, seems to be sufficient evidence of its distinct generic position.

Mitromyia conifer new species

Similar to *Calobata munda* van der Wulp (1897) in general appearance.

Rufous; ocellar tubercle, lunate spot before same, rounded spot laterad of antennae, anterior epistomal margin, spot above fore coxae, fore tibiae and second to fifth segments of fore tarsi, black. Middle and hind femora with narrow basal and distomedian paler rings. Bases of all tarsi white. Wing maculation similar to that of *C. munda*. Length, 8 to 10 mm.

Type.—Male; Higuito, San Mateo, Costa Rica, (P. Schild), [U. S. N. M., no. 27080].

Paratypes.—3 ♂, 4 ♀; topotypical. 1 ♂; Isthmus of Tehauntepec, (Sumichrast), [U. S. N. M.].

CARDIACEPHALA Macquart

The separation of Endelein's genera *Plocoscelus* and *Rhoecius* from *Cardiacephala* based on the characters given by Enderlein and Frey, does not seem practical. Neither the dilation of the tibiae nor the conical development of the paracephala do I consider of primary generic importance. These names, however, may prove to be available for groups containing their genotypes based on other characteristics, but I do not think our knowledge of this family at present is sufficient to establish their limits. I have, however, retained *Plocoscelus* for a group of species which seem to merit distinction.

The species of *Cardicephala sens. lat.* which I prefer to consider as constituting the tribe Cardiacephalini are characterized by the conical development of the dorso-apical region of the scutellum just anterior to the apical bristles, and the hind femora are more or less abruptly swollen beyond the middle.

Cardiacephala sens. str. contains but one, the following species, known to me, and its characteristics may be found in the structure of the mesofrons and the pattern of the wing maculation.

The position of the genus seems to be intermediate between the allies of *Rainieria* and of *Tæniaptera;* the anal cell is becoming attenuate; the frons simulating that of the latter genus.

Cardiacephala triluminata new name

1787. *Musca longipes* Fabricius, Mant. Ins., II, p. 348. [not Scopoli, 1763, p. 336.]
1805. *Nerius longipes* Fabricius, Syst. Antl., p. 265.
1825. *Calobata longipes* Wiedemann, Ausseur. Zweifl. Ins., Vorb., p. xii.
1843. *Cardiacephala longipes* Macquart, Dipt. Exot., II, (3), p. 243, pl. 31, fig. 7.

The preoccupation of Fabricius' name by Scopoli for a European species necessitates the renaming of this species.

The species is the genotype of *Cardiacephala* Macquart by original designation, and as known to me may be distinguished as follows:

The vertical region of the head is somewhat flattened and polished, with the paracephala conically produced at outer vertical bristles, leaving the postverticals in a deep cleft at the extremity of the opaque, velvety black mesofrons. A dark species with the middle and hind legs mostly pale. The apical portions of the wings rather evenly infuscated with three rounded hyaline spots, one in each cell.

BRITISH GUIANA: Paramaribo, (K. Mayo), [A. N. S. P., 5].
DUTCH GUIANA: Bartica District, [N. Y. Z. S., 2].

PLOCOSCELUS Enderlein

1922. *Plocoscelus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 227.

I have retained this name for those Cardiacephalini in which the mesofrons has a median fusciform subopaque area surrounding the ocellar group, extending almost the entire length of the frons, with linear extremities. The wing pattern contains a more or less hyaline apical area transversed by a narrow subapical band of fuscous spots, which are sometimes contiguous; the extreme apex of the wing more or less hyaline, sometimes faintly clouded. The tibiae may or may not be dilated. The frons is sometimes very much flattened, becoming broader and sharply margined at the, often tuberculose, vertex.

This genus is based on *Calobata arthritica* Wiedemann (1830), the type of which is a female from "Mexico, (Dippe)" which Enderlein seems to have seen. I do not know the species; nor do I think it can be recognized from the meagre original description.

I do not consider the dilation of the tibiae, the character upon which the genus *Rhoecius* Enderlein (1922) was based, of generic importance; and not being acquainted with *Rhoecius valgus* Enderlein (1922), its genotype, unless it is synonymous with *C. nigra* Schiner, I cannot suggest any other correlating character by which that name may be retained. Enderlein, however, states that the genus is similar to *Plocoscelus*, and so, one would suppose that it is allied to *Cardiacephala*. This being the case we cannot include *Calobata platycnema* Loew (1866) as a member of the genus as Enderlein cites, for as I know that species it is not a Cardiacephalini.

Plocoscelus myrmex (Schiner)

1868. *Cardiacephala myrmex* Schiner, Reise Novara, Zool., II, p. 254.

Very different from *C. triluminata*, not only in its ferruginous color but in its subglobose head, subvertical eyes, convex, not conical paracephala, mesofrons with a longitudinal median, more shining, line including and surrounding the ocelli and in a different maculation of the wings. The general color ranges from ferruginous to dark brown, with the fore femora and distomedian rings on middle and hind femora, darker. Length, 5 to 8 mm.

A common Central American species. Dr. Wheeler has given an interesting note on its courting habits.[16]

MEXICO: Cordoba, March 16, (Knab), [U. S. N. M., 3].

GUATEMALA: Cacao Trece Aguas, Alta Vera Paz, (Barber & Schwarz), [U. S. N. M., 1]. La Providencia, Obispo, April, (Aldrich), [U. S. N. M., 5]. Livingston, June 5, (Barber), [U. S. N. M., 1]. Quirigua, April 7, (Aldrich), [U. S. N. M., 1]. Tamau, Alta Vera Paz, May 25, (Aldrich), [U. S. N. M., 1].

HONDURAS: Corocito, April 3, (Bequaert), [Bequaert, 3]. Puerto Castilla, May 6, (Painter), [Painter, 32]. La Providencia, Obispo, (Rouillard), [U. S. N. M., 1].

COSTA RICA: Higuito, San Mateo, (Schild), [U. S. N. M., 38]. Bonnefil Farm, Rio Surubres, October 17, (Calvert), [A. N. S. P., 1].

PANAMA: Alhajuelo, April 19, (Busck), [U. S. N. M., 3]. Bejuco Rio, (Schaus), [U. S. N. M., 1]. La Charrera, May 12, (Busck), [U. S. N. M., 5]. Paraiso, January, (Busck), [U. S. N. M., 3]. Porto Bello, February to April, (Schwarz & Busck), [U. S. N. M., 6]. Taboga Island, February 22, (Busck), [U. S. N. M., 4]. Trinidad Rio, February to June, (Busck), [U. S. N. M., 3]. Barro Colorado, Canal Zone, June to July, (Banks), [M. C. Z., 22]. Corazal, Canal Zone, April 27, (Busck), [U. S. N. M., 3]. Fort Davis, Canal Zone, July 5, (Banks), [M. C. Z., 1]. Gamboa, Canal Zone, January 3, (Sanders), [U. S. N. M., 1].

COLOMBIA: Aracataca, Magdalena, July 24, (Rehn), [A. N. S. P., 1]. Hacienda Victoria, Sierra San Lorenzo, Magdalena, July 26, (Rehn), [A. N. S. P., 1].

Plocoscelus punctipennis (Macquart)

1843. *Calobata punctipennis* Macquart, Dipt. Exot., II, (3), p. 247.

1922. *Plocoscelus punctipennis* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 226.

This species was originally described from Brazil and Chili. Enderlein records it from Brazil. I rather doubt the conspecific

[16] Jour. Genetics, XV, p. 484, (1924).

status of the Brazilian and Chilian material. Apparently very similar to *Calobata podagrica* Rondani (1848), from Brazil.

The two specimens before me from Rio de Janeiro, Brazil, November, (H. H. Smith), [A. M. N. H.] agree well with Macquart's description, and I feel that my determination is correct. Although Enderlein describes the fore tarsi as black, Macquart specifically says "tarses anterieurs noirs, a premier article blanc."

Entirely ferruginous, my specimens not at all shining except above the fore, middle and hind coxae, and some areas on the abdomen. Frons uniform in color and opacity, slightly depressed between inner verticals; vertex sharp at postverticals, but not at the outers. All femora pale; middle and hind ones more or less darkened medianly, and with narrow whitish rings basally; fore tibiae dark; at least basal three-fourths of fore, middle and hind tarsi, white; swelling of hind femora gradually diminishing distally. Wings with subapical band of three small infuscated spots. Claspers of male stout, the short fingers curving together at tips. Length, 7 mm.

Ploscelus harenosus new species

Very much suggesting *myrmex*, but the frons and vertex more flattened, almost with the latter more sharply margined at the inner vertical bristles.

General color dark ferruginous, with irregular darker areas on the head, thorax, and abdomen, especially the posterior part of mesonotum, scutellum, and metanotum. Fore legs entirely blackish (middle legs missing), hind legs ferruginous, with base of tarsi whitish. Frons very much wrinkled; paracephala turgid, but not tuberculose at outer verticals. Thorax except propleura, scutellum and metanotum, opaque; abdomen shining except third and fourth segments which are subopaque. Claspers of male short; the short fingers strongly curving together at tips. Legs slender; the swelling of hind femora very pronounced. Wings pattern as in *myrmex*. Length, 8 mm.

Type.—Male; Puerto Colombia, Atlantico, Colombia, July 11–12, 1920, (J. A. G. Rehn), [A. N. S. P., no. 6387].

Paratypes.— ♀ ; Fort Sherman, Canal Zone, Panama, July 3, 1924, (N. Banks), [M. C. Z.]. 1 ♂; Paraiso, Canal Zone, Panama, February 11, (E. A. Schwarz), [U. S. N. M.].

A female from Pedro Miguel, Canal Zone, Panama, April 10, 1923, (R. C. Sherman), [U. S. N. M.] is apparently conspecific, but the middle and hind legs are missing.

Plocoscelus schildi new species

I cannot consider this species *Calobata podagrica* Rondani[17] from Brazil which has the bases of the tarsi white. The present species has not the strongly flattened and tuberculose vertex of *townsendi*. The pale scutellum is quite noticeable.

Black; upper occiput, anterior part of frons, face, base of antennae, inferior margin of palpi, humeri, scutellum, fore femora basally, middle and hind legs, tawny to ferruginous. Middle and hind femora dark medianly; fore coxae, their tibiae and tarsi, black, but the flexor scopa of latter, pale. Opaque, with occiput, scutellum, pleura, metanotum and base of abdomen, more or less shining. Wings as in *myrmex*. Frons flattened above but vertex rounded. Length, 5 mm.

Type.—Male; Higuito, San Mateo, (Pablo Schild), [U. S. N. M., no. 27264].

Paratypes.—2 ♀ ; topotypical, but much smaller (4 mm.) and apparently conspecific (their teneral condition precludes critical examination).

Plocoscelus modestus new species

Very similar to *P. harenosus* here described, but more tawny, without dark areas on thorax; fore coxae and fore femora, pale; fore tibiae and tarsi and middle tibiae, black; hind tibiae ferruginous; middle and hind tarsi whitish basally. Abdomen except first segment, brown, subopaque; first segment pale posteriorly as well as the anterior angles of second, whitish purinose. Length, 7 mm.

Type.—Female; Puerto Barrios, Guatemala, April 20, 1924, (Painter), [A. N. S. P., no. 6388].

Another female from Penal Settlement, Bartica District, British Guiana, 1917, [N. Y. Z. S.] is probably conspecific, but is not in very good condition.

Plocoscelus picinus new species

In this we have an almost totally blackish species with the frons deep ferruginous; the occiput, nodose part of first abdominal segment, bases and apices of middle and hind femora, paler. Middle and hind tarsi whitish basally. Opaque, with frons, in part, vertex, occiput, scutellum, metanotum, first, fifth and

[17] Studi Ent., I, p. 86, (1848).

ovipositor segments and legs, shining to polished. The swelling of hind femora very pronounced. Length, 7 mm.

Type.—Female; Red Tank, Canal Zone, Panama, June 30, 1924, (N. Banks), [Museum of Comparative Zoology Collection].

Paratypes.—4 ♀ ; topotypical.

Plocoscelus townsendi new species

This may be *P. brevipennis* Enderlein[18] but I would not consider it to be *Calobata brevipennis* Walker described from Brazil, without an examination of Walker's type, and I cannot associate my material with Bigot's description of *Calobata camptomera* also from Brazil which Enderlein synonymizes with Walker's species. Enderlein records *brevipennis* from Ecuador, Colombia and Surinam.

Similar to *nigra*, but the tibiae are not dilated and the vertical margin of the frons does not have the conical paracephalic tubercles at the outer vertical bristles.

Black: proboscis ferruginous; basal segment of all tarsi, white. Middle and hind legs yellowish to tawny, but their femora with a broad black, median, ring. Lower margin of palpi white (as is general with the species of this genus). Frons anteriorly ferruginous, almost smooth, not wrinkled. Vertex flattened, shagreened. Mesonotum opaque, shagreened; pleura pruinose, polished on mesopleura anteriorly. Scutellum and metanotum shining; sternopleural comb of pale hairs. Apical portion of wings hyaline with transverse series of three small spots. Length, 7 mm.

Type.—Male; Rio Charape, Peru, September 13, (C. H. T. Townsend), [U. S. N. M., no. 27089].

Paratypes.—1 ♂, 1 ♀ ; topotypical. 6 ♂; Puerto Bermudez, Rio Pichis, Peru, July, (Cornell Expedition), [Cornell]. 1 ♂; Bartica, British Guiana, May 20, [A. N. S. P.]. 1 ♀ ; Kartabo, Bartica District, British Guiana, [N. Y. Z. S.]. 1 ♀ ; Paramaribo, Dutch Guiana, (K. Mayo), [A. N. S. P.]. 3 ♂; San Alberto, Rio Blanca, Amazonas, Brazil, August 27, [Bequaert].

Plocoscelus nigra (Schiner)

1868. *Cardiacephala nigra* Schiner, Reise Novara, Zool., II, p. 255.

Although I do not find perfect agreement with the original description, it is probable that the specimens before me are

[18] Arch. f. Naturg., 1922, A, Hft. 5, p. 227, (1922).

correctly determined. The broadly dilated tibiae are characteristic. The species was originally described from "South America" and has been recorded from Mexico and Guatemala.[19] Most of my material is from Central America.

I strongly suspect the synonymy of *Rhoecius valgus* Enderlein,[20] as I cannot find any differentiating characters applicable to my specimens which seem to agree equally well with the descriptions of both *nigra* and *valgus*.

Black; frons, face, proboscis, lower margin of palpi, base of hind femora, bases of middle and hind tarsis, paler. With general build of *P. townsendi* Cresson above described, but the paracephala are not conically produced, but the middle and hind tibiae are strongly dilated and flattened.

GUATEMALA: Ingenio Railway Station, April 28, (Aldrich), [U. S., 3]. La Providencia, Obispo, (Rouillard), [U. S. N. M., 1]. Quirigua, May 7, (Aldrich), [U. S. N. M., 1].

HONDURAS: Corocito, April 3, (Bequaert), [Bequaert, 1]. Puerto Castilla, May 6 to June 21, (Painter), [Painter, 10]. Sangrelaya, April 13, (Bequaert). [Bequaert, 2].

PANAMA: Alhajuela, April 19, (Busck), [U. S. N. M., 1]. Trinidad Rio, June 7, (Busck), [U. S. N. M., 4].

BRAZIL: Puerto America, Rio Putumayo, August, (Cornell Expedition), [Cornell, 1].

The male from Brazil is larger than the specimens from Central America, (10 mm.), but appears to be conspecific.

Parasphen frontalis new species

This species seems to agree with the description of *P. amazonicus*, but the coxae and legs are more yellowish. I do not think the two are conspecific.

Head ferruginous to tawny; paracephala and frons darker, former silvery, latter polished black; mesofrons from vertex to and intergrading with frontalia, opaque. Thorax ferruginous below; mesonotum and metanotum black, the former marked with opaque black, and shagreened aeneous, designs. Abdomen ferruginous, becoming darker basally. Legs (hind pair want-

[19] Biol. Cent.-Amer., Dipt., II, p. 376, (1897).

[20] Arch. f. Naturg., A, Hft. 5, p. 288, (1922).

ing) tawny; fore femora above and apically, fore tibiae, third to fifth segments of fore tarsi, black; first and second segments of fore tarsi, white. Knob of halteres dark. Wings yellowish hyaline, with faint discal and apical infuscations.

Head higher than long, broader than high. Occiput normal, convex. Ocellar tubercle far in advance of postorbital line; inner verticals aligned with posterior orbits, postverticals absent. Face longer than broad. Palpi large, broad. Third segment of antennae ovate, nearly twice as long as broad; arista with long plumosity. Thorax as high as long; humeri elongate. Anterior margin of mesonotum convex, but not declivous in profile; scutum flattened; no dorsocentrals; sternopleural comb of numerous bristles in several series. Legs slender. Third costal section one-third as long as ultimate section of fourth vein. Annal cell very long. Length, 10 mm.

Type.—Female; Kartabo, Bartica District, British Guiana, March 11, 1922, [N. Y. Zoological Society Collection].

Paratypes.—1 ♀; Kamakusa, British Guiana, (H. Long), [Bequaert]. 1 ♀; British Guiana, (Parish), [U. S. N. M.].

GRALLOMYIA Rondani

1850. *Grallomyia* Rondani, Nov. Ann. Sci. Nat. Bologna, (3), II, p. 180.
1922. *Grallomyia* Enderlein, p. pt., Arch. f. Naturg., 1922, A, Hft. 5, p. 213.

This genus reminds one very much of *Systellapha* in the frontal structure, in the anteriorly broad, smooth, shining, parafrons, and in the anteriorly narrowed, often rotund opaque, mesofrons.

GENOTYPE: *Calobata tarsata* Wiedemann, 1830. [Original designation.]

I cannot consider Enderlein's nor Frey's conception of this genus, but have recognized it as containing those *Taeniapterinae* having the anal cell long and narrow; third costal section long; parafrons smooth and broad anteriorly; arista bare. The wing pattern in this genus consists typically of a broad, sharply defined median band or area, with its distal margin more or less brokenly concaved at about the posterior crossvein, and its proximal margin brokenly convex, not quite attaining the anterior crossvein. In addition there is a more or less developed narrow band basad of the anterior crossvein, and another narrow subapical band just distad of the tip of second vein. These latter two bands are often wanting in the species with a recessive pattern, and the subapical band is sometimes broken up into spots

between the veins. The apical area of the wing is generally somewhat infuscated. In the species with a recessive pattern there is only the median and apical infuscations present, or, in extreme cases the wing may be entirely immaculate.

There are two species-groups present which may merit generic or subgeneric recognition, but I do not care to propose them as such at present.

Grallomyia tarsata (Wiedemann)

1830. *Calobata tarsata* Wiedemann, Aus. Eur. Zweifl. Ins., II, p. 541.
1903. *Calobata annulata* v. d. Wulp, Biol. Cent.-Am., Dip., II, p. 373, pl. 9, fig. 27. [Not Fab., 1805.]
1922. *Grallomyia tarsata* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 218.

There need to be no confusion about this species, if our interpretation of Wiedemann's description is correct. Here we have a dark insect including the bases of fore and middle femora, that of the middle femora pale; also middle and hind femora with a pale distomedian ring. Fore tarsi except extreme bases, white; those of middle and hind legs, dark. Palpi broad, black, with white convex, inferior, margin. Mesofrons flat, elongate, not sharply defined, at most narrowly attaining anterior and vertical margins. The scutellum is distinctly pilose. The female has distinct, flat, discoid, rufous, prehumeral areas.

GUATEMALA: Barrios, March 31, (Painter), [Painter, 1]. Cayuga, June, (Schaus), [U. S. N. M., 2]. Quirigua, May 7, (Aldrich), [U. S. N. M., 2].

HONDURAS: Puerto Castilla, May 6, (Painter), [Painter, 5]. Sangrelaya, April 13, (Bequaert), [Bequaert, 3], [U. S. N. M., 1].

PANAMA: Cabina, May 23, (Busck), [U. S. N. M., 1]. Porto Bello, February to April 12, (Busck), [U. S. N. M., 18]. Trinidad Rio, May 2, to June 2, (Busck), [U. S. N. M., 3].

BRITISH GUIANA: Bartica, May, [A. N. S. P., 1]. Kartabo, Bartica District, July, [N. Y. Z. S., 8].

DUTCH GUIANA: Paramaribo, (Mayo), [A. N. S. P., 5].

BRAZIL: Chapada, November, (Smith), [A. M. N. H., 1]. Rio de Janeiro, November, (Smith), [A. M. N. H., 1].

Grallomyia rufifacies (Macquart)

1850. *Calobata rufifacies* Macquart, Dipt. Exot. Suppl., IV, p. 299.
1922. *Grallomyia rufifacies* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 219,

I am following Enderlein as regards this species. Macquart's description based on a female without legs, does not contain much of value.

My material consists of a male from Kartabo, Bartica District, British Guiana, [N. Y. Z. S.], in rather teneral condition, and a female from Lower Rio Negro, Amazonas, Brazil, August 20, 1924, [Bequart].

Here we have a black species much resembling *tarsata*, in which the fore and middle tarsi entirely, and hind tarsi basally, bases and distomedian rings of middle and hind femora, white to whitish yellow; basal half of fore femora tawny. Frons shining, ferruginous anteriorly, polished black at vertical angles; no postverticals. The opaque mesofrons elongate, scarcely narrowly attaining anterior and vertical margins, flat or weakly convex. Female without prehumeral discoid areas.

Grallomyia bonitoensis new species

In the color pattern of the thorax, this species suggests *flavipes* Macq., but the antennae and face are much longer and the fore tarsi are brown. The type specimen lacks the outer vertical bristles and there seem to be no scars or indications of their having been present.

Black; head mostly dark brown; paracephala and epicephala polished, metallic tinged; mesofrons brown, broad; inner and postverticals aligned. Facial carina broad, twice as broad as diameter of second antennal segment. Palpi broad, whitish apically. Arista bare. Third antennal segment twice as long as broad. Thorax short, as high as long; mesonotum convex; subopaque, with a velvety black spot above humeri; a median longitudinal line, broader posteriorly, a transverse band over suture, and another at base of scutellum, subopaque, brown, leaving a rounded, presutural, and a supraalar, spot, metallic steel blue and more or less cinereous. One dorsocentral present. Pleura brown, with reflecting cinereous spots. Pteropleural callus very prominent. Abdomen metallic steel blue, polished, with genital segments ferruginous. Claspers of male simple, with fingers strongly arched and finely granulose mesally. Fore femora yellow, with broad median band. Middle femora with broad basal and distomedian bands yellow. Hind femora with basal third and distomedian band, yellow. All tarsi brown. Wings yellowish hyaline, at most faintly infuscated medianly; third costal section about one-half as long as ultimate of fourth; first posterior cell open. Length, 10 mm.

Type.—Male; Bonito, Province Pernambuco, Brazil, (Collected on cotton), [U. S. N. M., no. 27084].

Grallomyia vittipennis (Coquillett)

1902. *Calobata vittipennis* Coquillett, Proc. U. S. Nat. Mus., XXV, p. 125.
1922. *Grallomyia vittipennis* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5. p. 213.

This is the only species of the genus known to me having the wing pattern in form of a longitudinal stripe. This runs through the first posterior cell. There are no outer vertical bristles present.

MEXICO: Frontera, May 3, (Dyar), [U. S. N. M., 1; topotype].
GUATEMALA: Puerto Barrios, February 24, (Dean), [U. S. N. M., 1].
HONDURAS: Puerto Castilla, June 4, (Painter), [Painter, 1].
PANAMA: Bueno Ventura, March 10, (Busck), [U. S. N. M., 1].

Grallomyia aeripennis Enderlein

1922. *Grallomyia aeripennis* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 214.

The general habitus of this species with its conically developed pterocallus, strongly suggests species of the genus *Mesoconius*, and were it not for the long attenuated anal cell and the annulation of the femora, we would certainly place it in or near that genus. I do not think it is a member of the present genus, but cannot suggest any more appropriate position than here without erecting another genus, which treatment would just as well apply to some other species of this group.

COLOMBIA: La Cumbre, December 15, (Viereck); [Canada, 3].
PERU: Rio Charape, September 14, (Townsend), [U. S. N. M., 1].

Grallomyia flavipes (Macquart)

1848. *Calobata flavipes* Macquart, Dipt. Exot. Suppl., III, p. 67, pl. 7, fig. 14.
1922. *Grallomyia flavipes* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 213.

Macquart's original description calls for "Face noire; une petite tache noire de chaque cote: . . ." There seem to have been a lapsus calami on the part of the author, or a typographical error on the part of the printer as regards the "Face noire." In all other respects his description is quite deciding, and I think there is no doubt as to my determination. The yellowish head, subconically convex mesofrons, yellowish white pruinose thoracic markings, yellow, narrowly annulated (oblique on middle and hind) femora, are the conspicuous characteristics of this species. The third antennal segment is short. The subbasal ring on the middle and hind femora is sometimes very faint becoming almost obsolete, but that of the fore femora seems to be more constant.

This is not *Calobata flavipes* Meijere (1914) described from Java and which probably is not congeneric with the present species.

British Guiana: Kartabo, Bartica District, February 24, [N. Y. Z. S., 1]. Brazil: No data, (H. B. Merrill), [U. S. N. M., 1]. Chapada, (H. Smith), [A. M. N. H., 2].

Grallomyia stellata (van der Wulp)

1897. *Calobata stellata* van der Wulp, Biol. Cent.-Amer., Dipt., II, p. 373.
1922. *Grallomyia stellata* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 213.

This species was described from Mexico, and is very similar to *flavipes* Macquart, but the series before me seem to be constant in that the dark femoral rings are transverse, and the middle and hind femora are paler yellow. We may here have merely a variety or race of *flavipes*, which occurs only in Central America, as there is a tendency in some specimens for the femoral rings to become oblique. At present, however, it seems advisable to retain *stellata* for this form.

The type, a female, is no doubt a specimen in which the ferruginous color of the anterior part of the thorax is more extensive or more intense. I have seen several individuals showing such tendency.

Guatemala: La Providencia, Obispo, April 15, (Aldrich), [U. S. N. M., 4]. Palochic Rio, March 22, (Barber & Schwarz), [U. S. N. M., 1].

Honduras: Corocito, April 3, (Bequaert), [Bequaert, 1]. Sangrelaya, April 13, (Bequaert), [Bequaert, 2].

Nicaragua: Chinandega, (Baker), [U. S. N. M., 1].

Costa Rica: Higuito, San Mateo, (Schild), [U. S. N. M., 12]. Rio Surubres, Bonefil Farm, October 16, (Calvert), [A. N. S. P., 2].

Panama: Alhajuela, April 17, (Busck); Cabina, May 20, (Busck); Porto Bello, March 13, (Busck); Trinidad Rio, March 29, (Busck); Tabernilla, Canal Zone, June 21, (Busck), [all U. S. N. M., 7]. Barro Colorado, Canal Zone, July 15 to August 1, (Banks), [M. C. Z., 9].

Venezuela: Cumaragua, (Blanco), [U. S. N. M., 1].

British Guiana: Georgetown, September 29, [Bequaert, 1].

Grallomyia scutellata new species

Similar in general appearance to *flavipes* Macquart, but smaller, with the thorax distinctly higher than long; head nearly as high as broad resulting in a narrower and longer face throwing the

antennae closer together. The mesofrons is flat, broad, with the ocelli well in the upper portion, but obtusely angular anteriorly, not attaining the lunular margin. Wings immaculate; third costal section longer than the ultimate of fourth; first posterior cell closed slightly before costa; anal cell relatively short, its extension not much longer than the width of cell.

This species is included here but I suspect that it represents a distinct genus. The short anal cell is not typical of this genus, nor of this generic group, but the species seems to be more characteristic of *Grallomyia* in other respects than it is of any other genus.

Black, including fore tibiae and tarsi; anterior angles and margin of frons, base of third antennal segment, facial orbits, cheeks, lower occiput, squamae, fore coxae and femora except preapical rings, middle and hind tibiae and tarsi, yellow. Frontal orbits, vertex, face, clypeus, antennae, halteres, genital segments, brown. Mesofrons velvety black, whitish above and around ocelli; palpi black except whitish tips; parafrons shining, not setulous. Mesonotum yellowish white pollinose, with broad, brown, median stripe, dilated at anterior and posterior extremities and at suture. Scutellum velvety black; pleura and mesanotum silvery. Claspers of male simple, slender. Length, 4 to 5 mm.

Type.—Male; Tabernilla, Canal Zone, Panama, February 6, 1911, (A. Busck), [U. S. N. M., no. 27885].

Paratypes.—2 ♀ ; topotypical.

Grallomyia buscki new species

Allied to, and very similar to, what I consider *Calobata testacea* Fabricius, but lacks the black face and the mesonotal spots. The arista is bare; and the discal infuscation of the wings is more triangular in outline, with an attenuated extension towards the costa. Also similar to *G. luridilabris* Enderlein, but the face, and the mesofrons at the vertex are pale.

Tawny to ferruginous. The shining paracephala, brown; opaque mesofrons anterior to ocelli, dark brown to black, posterior to ocelli, pale. Parafrons pale, smooth. Facial foveae and median spot on clypeus, dark. Abdomen brownish with first segment paler; apex of ovipositor dark. Apical third of fore femora and all tibiae, black. Fore tarsi white. Middle femora brownish with basal fourth paler; a subapical ring whitish. Hind femora pale; with dark subapical and distomedian rings; between these rings the color is whitish. Wings yellowish, with

a discal cloud having a distal costal extention to the second vein; apex faintly infuscated, leaving an area between the two, hyaline.

Antennae well separated, third segment almost discoidal; arista bare; palpi broadly filiform. Postverticals present. Mesofrons broadly fusciform. One dorsocentral. Third costal section almost as long as ultimate of fourth. Ultimate of sixth one-half as long as anal crossvein. Length, 8 mm., excl. of ovipositor.

Type.—Female; Alhajuela, Panama, March 2, 1912, (A. Busck), [U. S. N. M., no. 27083].

A female from Higuito, San Mateo, Costa Rica, (P. Schild), [U. S. N. M.], is darker but as the specimen is mouldy the real color may be thus affected. Otherwise it appears to be conspecific.

Grallomyia testacea (Fabricius)

1805. *Calobata testacea* Fabricius, Syst. Antl., p. 261.
1830. *Calobata testacea* Wiedemann, Auss. Zweifl. Ins., II, p. 534.
1922. *Grallomyia testacea* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 2.13

The two black superhumeral spots are rather characteristic of this species, and which as I understand it may be diagnosed as follows:

Tawny to ferruginous; subopaque to shining. Vertex including areas at inner and outer verticals, mesofrons including ocelli, second antennal segment, narrow transverse line at lower end of facial foveae, base of palpi, opaque elongate spot above humeri, apices of fore femora and all of fore tibiae, brown to black. Abdomen with first and second segments and ovipositor pale. Wings brownish, with diffused, irregular, discal infuscation. Fore tarsi entirely white. Third antennal segment distinctly longer than broad, pale; mesovertical area also pale. One dorsocentral present. Third costal section almost as long as ultimate of fourth. Claspers of male slender.

I have seen the following from British Guiana: 1 ♂; Kartabo, Bartica District, April 6, [N. Y. Z. S.]. 1 ♀; Bartica, May 15, [A. N. S. P.].

Grallomyia luridilabris Enderlein

1922. *Grallomyia luridilabris* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 213.

I distinguish this species from *testacea* by the dark third antennal segment, dark mesofrons and mesovertical spot; the discal infuscation of the wings is in form of broad clouds along

the third and fourth veins, which clouds are more or less contiguous; and there is also a faint apical infuscation. The middle and hind femora are pale with a broad distomedian whitish band between two narrower darker rings. There are traces of proximomedian dark rings.

I have this species represented by a male from near Manaos, Amazonas, Brazil, August 23, [Bequaert]; and a male from Puerto Bermudez, Rio Piches, July, (Cornell Univ. Exped.), [Cornell].

A female from Rio de Janeiro, Brazil, October, [Cornell], may be a distinct species. The thoracic spots are very faint; third antennal segment black except extreme base; arista entirely black; facial carina and clypeus anteriorly, black. The darkening of the mesofrons extends onto the parafrons, and the abdomen is entirely black. Middle femora black with narrow bases and subapical ring, yellow, and apices tawny; hind femora yellow with median and subapical rings black, apices tawny. The discal infuscation of the wings is more sharply defined, and a subapical interrupted band is in evidence.

Grallomyia ichneumonea (Brauer)

1885. *Calobata ichneumoneus* Brauer, Sitz., Math.-Nat. Classe, Acad. Wissen. Wien, XCI, Ab. 1, p. 388, pl. 1, fig. 4.

1886. *Grallomyia caloptera* Bigot, An. Soc. Ent. France, (6), VI, p. 381. [Syn., v. d. Wulp, 1897.]

1922. *Ptilosphen ichneumoneus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 223.

This species was placed in his new genus *Ptilosphen* by Enderlein, which genus he separates from *Grallomyia* by the "mehr oder weniger kurze oder lang Pubescenz der Fuhlerborste." Only under high magnification am I able to discern any pubescence in the specimens before me, which same is very sparse and appressed and only on the thickened basal portion, the hair like apical portion being entirely bare. Van der Wulp[21] says that the arista is "nearly or quite bare." I cannot, therefore, associate this species with those of typical *Ptilosphen*. On the other hand its general similarity to *Calobata testacea* Fabricius and *C. flavipes* Macquart as known to me, is evident. It cannot be associated with *Musca lasciva* Fabricius in the genus *Taeni-*

[21] Biol. Cent.-Amer., Dipt., II, p. 374, (1897).

aptera. The claspers of the male are very characteristic, the fingers being long and slender, rather abruptly convergent, the hook like terminals ending in small mesally nodulose knobs, with a mesal comb of black nodules or spinules just before the hooks.

MEXICO: No data, [A. N. S. P., 5].

GUATEMALA: Antigua, May 2, (Aldrich), [U. S. N. M., 1]. El Salto, Antigua, May 1, (Aldrich), [U. S. N. M., 2].

Grallomyia lauta new species

This species is placed in *Grallomyia*, provisionally. The third costal section is not one-half as long as ultimate fourth. It has the general build of *C. insignis* Wiedemann, but the head is distinctly higher than long.

Ferruginous to yellow. Vertex, velvety mesofrons, apices of fore femora, and fore tibiae, black. Abdomen dark apically. Middle and hind femora with pale rings beyond middle; fore tarsi white. Wings hyaline, with two infuscated spots in submarginal cell beyond anterior crossvein, and two in first posterior cell.

Ocellar tubercle in upper part of mesofrons well removed from line of inner verticals. Opaque part of mesofrons rounded, not much angled anteriorly and not attaining lunular margin, attenuated behind ocelli to line of inner verticals. Postverticals absent. Upper frontals opposite ocelli, another bristle opposite middle of mesofrons. Antennae well separated. Face broader than long. Palpi dilated, somewhat convex below. Thorax as high as long. Third costal section of wings one-third as long as ultimate of fourth; first posterior cell open; anal cell long acuminated. Length, 9 mm.

Type.—Female; Paraiso, Canal Zone, Panama, January 23, 1911, (E. A. Schwarz), [U. S. N. M., no. 27088].

PTILOSPHEN Enderlein

This genus, based on *Calobata insignis* Schiner as known to me, is a group of species having much the general habitus of *Rainieria*, especially in the globose form of the head and the elongate thorax, but has the elongate, attenuated anal cell of *Taeniaptera*.

It is certainly allied to *Grallomyia*, having the same wing pattern and other correlations, but differing in that the arista is plumose and the postvertical bristles are wanting. These characteristics will also distinguish the genus from *Taeniaptera*.

Ptilosphen cyaneiventris (Macquart)

1846. *Calobata cyaneiventris* Macquart, Dip. Exot. Suppl., I, p. 215, pl. 19, fig. 5.

1886. *Calobata callichroma* Bigot, An. Soc. Ent. France, (6), VI, p. 373. [Syn., Enderlein, 1922.]

1922. *Ptilosphen cyaneiventris* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 224.

This species is easily recognized by the rufous antennae and thorax, basal and distomedian pale rings on middle and hind femora, black apices of all tarsi and the sharply defined median infuscated band on the wings. An apparently common species.

MEXICO: Cordoba, March 16–21, (Busck), [U. S. N. M., 4].

GUATEMALA: Antigua, September 14, (Eisen), [U. S. N. M., 4]. Caco, Trece Aquas, Alta Vera Pas, (Barber & Schwarz), [U. S. N. M., 1]. La Providencia, Obispo, April 16, (Aldrich), [U. S. N. M., 3].

HONDURAS: Corocito, April 3, [Bequaert, 7]. Puerto Castilla, April 29, May 6, (Painter), [Painter, 6]. Sangrelaya, April 13, [Bequaert, 1].

COSTA RICA: Crillo; San Carlos; Zarzero; (all Schild & Burgdorf); Higuito, San Mateo, (Schild); Orotine, December, (Alfaro), [all U. S. N. M., 24].

PANAMA: Alhajuela, March 12, April 19; Porto Bello, April 19; Trinidad Rio, March 29; (all Busck), [all U. S. N. M., 7]. Barro Colorado, Canal Zone, July 19 to August 2, (Banks), [M. C. Z., 7].

COLOMBIA: Aracataca, Magdalena, August 10, (Rehn), [A. N. S. P., 2].

VENEZUELA: Carraquito, March 14, (Brown), [A. N. S. P., 1]. Valera, 1800 feet alt., (de Bellard), [U. S. N M., 1].

Ptilosphen enderleini new species

This species runs to *Calobata conveniens* v. d. Wulp[22] in Enderlein's key, but I do not think that author had the correct conception of van der Wulp's species. The present species is very similar to *insignis* Wiedemann, as known to me, but is almost entirely black.

Black; parafacials, lower margin of face, and clypeus, ferruginous; mouth parts, bases of fore and middle femora, subbasal ring on hind femora, median ring on middle and hind femora, and bases of hind tarsi, yellow to tawny; fore tarsi entirely white. Halteres dusky. Wings hyaline basally, brownish tinged apically, with a cloud between the crossveins.

Head globose. Mesonotum opaque black, with two median aeneous, subopaque stripes, contiguous at anterior margin and

[22] Biol. Cent.-Amer., Dip., II, p. 373, (1897).

diverging to postalar regions; a similar but more shining notopleural stripe. Pleura and abdomen steel blue with usual white pruinose markings. Claspers of male simple, small, with proportionately large, pale basal portion. Length, 10 mm.

Type.—Male; Puerto Bermudez, Rio Pichis, Peru, July 12 to 19, 1920, (Cornell Univ. Exped., Lot. 569), [Cornell Univ. Colln.].

Paratypes.—3 ♀; topotypical.

Ptilosphen comis new species

This species also runs to *Calobata conveniens* v. d. Wulp in Enderlein's key, but I do not think it is conspecific. The head is very dark, brownish to black on the occiput; fore femora entirely black; wings with only one band (median) and apex faintly infuscated.

Black; frons, face, and palpi, ferruginous to yellowish; antennae sometimes darker; vertex, occiput, clypeus, brown to black. Fore tarsi entirely white; bases and disto-median rings on middle and hind femora yellow. Mesofrons ferruginous; paracephala polished, metallic tinged. Mesonotum shining steel blue, somewhat whitish, with darker median and lateral stripes including scutellum, leaving the humeri and notopleura somewhat silvery as are also the pleura and metanotum.

Face longer than broad. Claspers of male with broad base, which is longer than the fingers; the latter arcuate, converging, tip to tip, with mesal surfaces dentate, and with a short basal prong in the same plane. Wings with discal irregular spot and an apical cloud. Anal crossvein almost twice as long as ultimate sixth. Length, 11 mm.

Type.—Male; Kamakusa, British Guiana, (H. Lang), [A. N. S. P., no. 6389].

Paratypes.—2 ♀; topotypical.

Ptilosphen tetrastigma (Schiner)

1868. *Calobata tetrastigma* Schiner, Reise Novara, Dipt., II, p. 252.
1922. *Ptilosphen tetrastigma* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 225.

This species was originally described from South America. Enderlein records it from Santa Catharina, Brazil. Before me is a female from Rio de Janeiro, Brazil, (H. H. Smith), [A. M. N. H.], which I consider this species. In Enderlein's key my specimen runs to *cinctiventris* Enderlein, but as his species was described from Colombia, I do not think the two are conspecific.

Ptilosphen mimicus new species

Very similar to my determination of *tetrastigma* Schiner, but is darker and is from an entirely different faunal environment.

Black to dark ferruginous; palpi, apices of palpi, fore coxae, bases of all femora, narrow median rings on middle and hind femora, pale. First segment of fore tarsi, only, white. Wing maculation distinct, with a zig-zag infuscated band between the crossveins and another along the proximal margin of a broad apical infuscation, also a faint spot proximad of anterior crossvein. Mesonotum with blue reflections medianly. The velvety black mesofrons attaining lunular margin in a point. Propleural comb well developed, of long black bristles. Length, 10 mm., excl. ovipositor.

Type.—Female; Piches & Perene Valleys, Peru, 200 to 3000 feet alt., (Soc. Geog. de Lima), [U. S. N. M., no. 27087].

Paratypes.—2 ♀; topotypical.

Ptilosphen conveniens (van der Wulp)

1897. *Calobata conveniens* van der Wulp, Biol. Cent.-Amer., Dipt., II, p. 373.
1922. *Ptilosphen conveniens* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 225.

In this species as I recognize it, the bases of fore femora are pale, and the fore tarsi are entirely white. The wing maculation consists of a broad, irregular median, and a narrow subapical, band, with sometimes a trace of another, proximad of the anterior crossvein; these latter bands are probably very variable in intensity. Otherwise we have a species very similar to *tetrastigma* Schiner.

Of this species I have four specimens from Higuito, San Mateo, (Schild), [U. S. N. M.].

Ptilosphen gentilis new species

Very similar to *conveniens* but the fore femora are entirely black, and it differs from *P. facetus* Enderlein, described from Ecuador, in that the first to third segments of fore tarsi are white with apex darkened; and the pale bands on the legs are broader.

Black; mesofrons ferruginous; face, and antennae more or less tawny to yellow; palpi yellow; anterior portion of frons brown. Fore tarsi white, with apices brownish. Palpi, bases and disto-median rings on middle and hind femora, yellow. Wings hyaline

with a broad irregular median, a narrow subbasal, and an irregular subapical, bands, brown; apex distad of the latter brownish. Paracephala at vertex polished black; mesonotum subopaque aeneous, with reflecting blackish areas or stripes. Pleura and metanotum overcast with whitish. Scutellum opaque, black. Abdomen metallic steel blue, slightly overcast with whitish bloom, with black, opaque bands on segments two to five. Claspers of male with elongate pedicle, curved fingers, and anterior basal prong. Length, 12 mm.

Type.—Male; San Carlos, Costa Rica, (Schild & Burgdorf), [U. S. N. M., no. 27886].

Paratypes.—2 ♂, 4 ♀; topotypical.

Costa Rica: Turrialla (Schild & Burgdorf), [U. S. N. M., 1].

Panama: Buena Ventura, March 10, (Busck), [U. S. N. M., 1]. Porto Bello, February 28, March 3, (Busck), [U. S. N. M., 5].

TAENIAPTERA Macquart

1835. *Taeniaptera* Macquart, Hist. Nat. Ins., Dipt., II, p. 491.
1850. *Grallopoda* Rondani, Nov. An. Sc., Nat. Bolog., (3), II, p. 178.
1850. *Grallomyia* p. pt. Rondani, Nov. An. Sci. Nat. Bolog., (3), II, p. 180.

This is mainly a neotropical genus, with one nearctic species. It was proposed for the reception of one species, *Taeniaptera trivittata* Macquart, a synonym of *Calobata lasciva* Fabricius.

The genus is characterized by the bare arista, long attenuated anal cell, long third costal section, and the frons generally wrinkled with a small velvety black mesofrontal spot. Wings distad of the anterior crossvein generally infuscated, with a narrow straight or lunate hyaline band just beyond the tip of second vein. The first posterior cell may be open or closed. I cannot consider this latter a generic character and thus the synonymy of *Grallopoda*. The wing pattern is very constant as regards the relative widths of the discal cloud and the disto-median hyaline band. The former is always large, including the posterior crossvein, while the hyaline band is narrow, sometimes very narrow to almost wanting and generally lunate; the subbasal fuscous band is usually present and sometimes quite broad. The postvertical bristles are generally present.

With this generic conception there will be little or no difficulty in recognizing the species of the genus.

Taniaptera lasciva (Fabricius)

1798. *Musca lasciva* Fabricius, Syst. Ent. Suppl., p. 564.
1805. *Calobata lasciva* Fabricius, Syst. Antl., p. 262.
1835. *Taeniaptera trivittata* Macquart, Hist. Nat. Ins., Dipt., II, p. 491. [syn. Enderlein, 1922].
1903. *Calobata lunata* van der Wulp, Biol. Cent.-Amer., Dipt., II, p. 372. [syn. Enderlein, 1922].
1922. *Grallopoda lasciva* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 212.

The above synonymy is probably correct. So far as known to me this species is neotropical in distribution, and consequently records from the East Indies probably refer to other species. *Calobata albimana* Macquart (1843), based on specimens from Java, Jamaica, Cuba, and Pennsylvania, must be considered as unrecognizable until a type can be designated.

The closed first posterior cell is characteristic of this species. In addition we have the fore femora and bases of fore tarsi black. There is but one pair of dorsocentrals.

The following distribution is shown in the material examined:

FLORIDA: Larkins, January 13, (Viereck), [Canada, 1].

TEXAS: Brownsville, November 20, [Illinois, 6]. Harlingen, July 28, August 4, (Painter), [Painter, 4].

LOWER CALIFORNIA: San Jose del Cabo, [U. S. N. M., 1].

MEXICO: Cordoba, April 12, (Knab), [U. S. N. M., 1]. San Rafael, Vera Cruz, (Townsend), [U. S. N. M., 1].

HONDURAS: Puerto Castilla, March 26, [Bequaert, 2]; April 7, May 23, (Painter), [Painter, 5].

COSTA RICA: Higuito, San Mateo, (Schild), [U. S. N. M., 2].

PANAMA: Cabima, May 27, (Busck), [U. S. N. M., 1]. Gamboa, July 9, (Banks), [M. C. Z., 1]. Paraiso, Canal Zone, February 3 and March 25, (Busck), [U. S. N. M., 2].

CUBA: Havana, (Baker), [A. N. S. P., 4].

JAMAICA: (Fox & Johnson), [A. N. S. P., 2; det as *Calobat aloa* Walker].

PORTO RICO: Acerito, June, [N. Y. A. S., 5]. Adjuntas, June, [N. Y. A. S., 3]. Coamo Springs, July (N. Y. A. S., 10]. Fajardo, January 19, [N. Y. A. S., 2]. Manati, June and July, [N. Y. A. S., 3]. San Juan, July, [N. Y. A. S., 6]. Rio Piedras, February 17, (T. H. Jones; pupa from cane cuttings that had failed to germinate and was in decaying condition), [U. S. N. M., 1].

DOMINICA: June and July, (Foote; Yale Expd., 1913), [U. S. N. M., 5].

TRINIDAD: June 20, (Busck), [U. S. N. M., 1].

BRITISH GUIANA: Bartica District, [N. Y. Z. S., 1].

BRAZIL: Urucum, Corumba, Matto Grosso, December, (Harris), [Cornell, 3].

PERU: Puerto Bermudez, Rio Pichis, July 12, [Cornell, 4]. Rio Charape, September 19, (Townsend), [U. S. N. M., 1].

PARAGUAY: San Bernardino, (Fiebrig), [U. S. N. M., 3].

Taeniaptera lasciva var. **obliterata** new variety

A variety of *lasciva* in which the subapical lunate hyaline band of the wings is almost obliterated, merely a trace is discernable. The subbasal band, in the type, is somewhat contiguous with the median cloud, leaving the anterior crossvein in a diluted spot; the females have this band more isolated. The middle and hind femora are tawny, with the usual distomedian ring yellow, and the bases of the middle femora yellow.

Type.—Male; Ecuador, (Parrish; 1914), [U. S. N. M., no. 43148].

Paratypes.—2 ♀ ; topotypical.

Taeniaptera angulata (Loew)

1866. *Calobata angulata* Loew, Berl. Ent. Zeit., x, p. 47.
1922. *Grallomyia annulata* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 215.

This species has been determined by some authors as *Calobata annulata* Fabricius (1787), and one would judge from Fabricius' description of the arista as "setariis nigra" (in contrast with "setariis pilosa" or "setariis pilosa nigra" he described of other related species) that the arista is bare, which fact would influence one in considering the synonymy. However, I have word from Dr. Leander Czerny that Wiedemann's specimen of this species is not congeneric with *lasciva* which fact of course would remove this possibility.

I have seen the type of *angulata*, which is a male from "New Grenada" [Colombia], with the wings damaged, but I considered it conspecific with a specimen from Paramaribo, Dutch Guiana, when I made the comparison in 1921.

In this species there is but one dorsocentral, the basal segments of the fore tarsi are entirely white, or may be somewhat darkened basally, and the first posterior cell is open.

Honduras: Puerto Castilla, May 2, (Painter), [Painter, 2]. Sengrelaya, April 13, [Bequaert, 1]. Truxillo, April 11, (Painter), [Painter, 1].

Costa Rica: Higuito, San Mateo, (Schild), [U. S. N. M., 10].

Panama: Cabina, May 18 to 27, (Busck); Porto Bello, February 15, (Busck); [all U. S. N. M., 4]. Barro Colorado, Canal Zone, June 20 to August 1, (Banks), [M. C. Z., 33]. Bohio, Canal Zone, (Busck), [U. S. N. M., 1]. Tabernilla, Canal Zone, June 20, (Busck), [U. S. N. M., 3]. Taboga Island, February 23 and June 9 to 10, (Busck), [U. S. N. M., 8]; June 29, (Banks), [M. C. Z., 2].

Colombia: Aracataca, Magdalena, August 24, (Rehn), [A. N. S. P., 1].

BRITISH GUIANA: Bartica, May 11, [A. N. S. P., 1]. Kalacoon, Bartica District, [N. Y. Z. S., 1]. Kamakusa, January, (Lang), [Bequaert, 1].

DUTCH GUIANA: Paramaribo, (Mayo), [A. N. S. P., 3]; (Boune), [U. S. N. M., 1].

FRENCH GUIANA: Cayene, (Schaus), [U. S. N. M., 1].

TRINIDAD: June, (Busck), [U. S. N. M., 3].

GRENADA: September, (Busck), [U. S. N. M., 1].

BRAZIL: Rio Branco, Amazonas, San Alberto, August 27, [Bequaert, 1].

Taeniaptera munda (van der Wulp)

1891. *Galobata munda* van der Wulp, Biol. Cent.-Amer., Dip., II, p. 374, pl. 9, fig. 29.

1922. *Grallomyia munda*, Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 215.

A well marked species with ferruginous head and thorax, and black abdomen. There is but one dorsocentral; the fore tarsi are dark basally, and the hind tibiae are distinctly dilated.

GUATEMALA: Cayuga, April, (Schaus), [U. S. N. M., 1]. La Providencia, Obispo, (Roulliar) and (Aldrich, May 16), [U. S. N. M., 2]. Livingston, February 18, (Dean), [U. S. N. M., 1].

SALVADOR: Izalco, (Knab), [U. S. N. M., 1].

HONDURAS: Lombardia, (Mann), [U. S. N. M., 1]. Puerto Castilla, May 6, (Painter), [Painter, 1]. Sangrelaya, April 13, [Bequaert, 7].

Taeniaptera platycnema (Loew)

1866. *Calobata platycnema* Loew, Berl. Ent. Zeit., X, p. 47. (Cent., VII, 86).

1922. *Rhoecius platycnema* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 228.

I cannot consider this species congeneric with *Rhoecius valgus* Enderlein, as discussed elsewhere in this paper. The present species as known to me is allied to *Calobata munda* Loew. The thorax is ferruginous with two dorsocentrals, and the hind tibiae are strongly dilated and compressed, sabre-like.

COSTA RICA: Higuito, (Schild), [U. S. N. M., 3].

PANAMA: Porto Bello, March 13, (Busck), [U. S. N. M., 2]. Alhajuela, Canal Zone, May 28, (Busck), [U. S. N. M., 1]. Barro Colorado, Canal Zone, June 20 and July 30, (Banks), [M. C. Z., 11]. Fort Sherman, Canal Zone, July 5, (Banks), [M. C. Z., 1].

Taeniaptera parens Cresson

1926. *Taeniaptera parens* Cresson, Trans. Am. Ent. Soc., LII, p. 273.

A black species with two dorsocentrals; middle femora pale basally; hind tibiae somewhat dilated; hind tarsi dark basally.

HONDURAS: Sengrelaya, April 13, (Bequaert), [A. N. S. P., 2; typical series].

BRITISH GUIANA: Bartica, [N. Y. Z. S., 1]. Kamakusa, September, (Lang), [Bequaert, 3]. Kartabo, Bartica District, [Cornell 1; N. Y. Z. S., 2].

BRAZIL: Lower Rio Negro, Amazonas, August 21, [Bequaert, 2].

The South American specimens are not exactly in agreement with the type series, and are all females, but they appear to differ only in the less amount of darkening on the fore tarsi.

This may be *Grallomyia thiemei* Enderlein[23] described from Colombia, but Enderlein does not mention the number of dorsocentrals.

Taeniaptera planitibia (Enderlein)

1922. *Grallomyia planitibia* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 216.

Originally described from Guatemala, Mexico and Nicaragua. The type is presumably a male from Tumbador, Guatemala, July 1912, (Riedel).

Similar to *angulata* but the postverticals are absent; two dorsocentrals present; tibiae strongly dilated; basal half of first segment of fore tarsi dark, and bases of middle and hind tarsi pale.

Of this species I have seen two specimens from Higuito, San Mateo, Costa Rica, (Schild) [U. S. N. M.], and four from Sengrelaya, Honduras, [Bequaert].

Taeniaptera volens Cresson

1926. *Taeniaptera volens* Cresson, Trans. Am. Ent. Soc., LII, p. 273.

A black species without postvertical bristles; with two dorsocentrals and slender tibiae; in the latter character differing from *planitibia*.

Besides the typical series of six females from Porto Bello, Panama, I have seen three specimens from Trinidad Rio, Panama, June 12, (Busck), [U. S. N. M.].

Taeniaptera vulpes Cresson

1926. *Taeniaptera vulpes* Cresson, Trans. Am. Ent. Soc., LII, p. 273.

A black species with ferruginous head, two dorsocentrals, middle and hind femora and tibiae pale basally, and tibiae slender. The wing has the first posterior cell closed, and the pattern is rather broken up, suggesting species of *Grallomyia* in that there is a large diluted area about the posterior crossvein.

Besides the typical series of thirteen specimens from Trinidad Rio, Panama, I have seen another from Porto Bello, Panama, April 18, (Busck), [U. S. N. M.], and another from Quirigua, Panama, May 7, (Aldrich), [U. S. N. M.].

[23] Arch. f. Naturg., 1922, A, Hft. 5, p. 217, (1922).

Taeniaptera livida Cresson

1926. *Taeniaptera livida* Cresson, Trans. Am. Ent. Soc., LII, p. 274.

In this and the next following species we have the frons comparatively smooth, not wrinkled laterally; the mesofrons has a velvety black, rounded spot. A black species with two dorsocentrals; all tarsi whitish basally; tibiae slender.

PANAMA: Trinidad River, May 9, (Busck), [U. S. N. M., 7; typical series]. Porto Bello, March 13, (Busck), [U. S. N. M., 2]. Barro Colorado, Canal Zone, June 23, (Banks), [M. C. Z., 1].

British Guiana: Kartabo, Bartica District, [N. Y. Z. S., 1].

A female from Piches and Perene Valleys, Peru, 2000 to 3000 feet, alt., (Soc. Geog. de Lima), [U. S. N. M.], is probably conspecific with the type, but is slightly larger. The specimen is somewhat greasy and the color pattern is difficult to see.

Taeniaptera dilator Cresson

1926. *Taeniaptera dilator* Cresson, Trans. Am. Ent. Soc., LII, p. 274.

This species is very similar to *livida*, but the hind tibiae are much dilated and sabre-like; the femoral rings are very indistinct or wanting.

Besides the type form from Grenada, West Indies, I have seen two specimens from Trinidad, June 20, (Busck), [U. S. N. M.].

TENTHES new genus

I hesitate to propose this new genus in a family already overburdened with genera of doubtful validity, but cannot satisfactorily place the following species in any known genus. The systematical position of the genus is also doubtful, but seems to be best placed here.

In general build this species suggests those of *Taeniaptera*, but in detail examination we find no true bristles at all on the legs, but that these members, especially the femora are clothed with scattered, erect hairs on all surfaces, and similar hairs on the thorax and abdomen. The subclavate femora suggest species of *Cardiacephala*, but the scutellum here is normal. The head is hemispherical, with comparatively flat occiput; frons with anterior portion uniformally opaque, the fusciform mesofrons, attaining the lunular margin and almost the postverticals, is

broadest at the ocelli which are situated far in advance of the inner verticals; the polished paracephala terminate in a point at about middle of frons. Anal cell long and attenuated. Additional generic characters may be gleaned from the following description of the species. Unfortunately only the female sex is known.

Tenthes citatus new species

Black; frons anteriorly, mesofrons, face, mouth parts, antennae, all coxae, bases and apices of middle and hind femora, fore tibiae, apical half of middle and hind tibiae, all tarsi except apical two segments, yellow to rufous; middle and hind femora with subbasal, broad distomedian, and narrow subapical rings darker; also with a subapical paler almost white ring. Wings hyaline with a small subbasal spot and a broad triangular median cloud including the posterior crossveins; apex hyaline.

Subopaque, shagreened and overcast with cinereous pollen; mesofrons and parafrons opaque.

General build, slender. Head and eyes slightly higher than long. Occiput slightly convex, normal. Frons broadest at vertex, with orbits converging; frontalia normal, not differentiated from epicephala and discernible to beyond middle of frons; two frontals, outer, inner, and postverticals present, the latter aligned with posterior orbits. Ocelli far in advance of posterior orbits. Mesofrons fusciform, converging to point before reaching postverticals, almost evanescent anteriorly into the same color and opacity as that of the parafrons. Face long and narrow, more than twice as long as broad, clypeus slightly exerted. Cheeks linear. Palpi rather slender. Antennae short; third segment ovate; arista bare. Thorax longer than high, attenuated anteriorly; mesonotum convex but not at all decliveous at anterior margin, leaving the scale like pronotum prominent; scutum flattened between the one pair of dorcentrals. Sternopleural comb well developed. Scutellum convex, short, with two bristles, apical. Abdomen very slender; second segment longest, with sparse, erect, pale hairs but no appressed setulae. Legs slender; middle and hind femora swollen beyond middle with sparse, erect, pale hairs and some appressed setulae apically; tibiae very slender and long, not sulcate, with numerous setulae. Wings slender; third costal section about two-thirds as long as ultimate section of fourth vein; first posterior cell open; anal cell attenuating to near margin. Length, 7 mm.

Type.—Female; Puerto Bermudez, Rio Pichis, Peru, July 13 to 19, 1920 (Cornell Expedition), [Cornell Univ. Colln.].

Subfamily MICROPEZINAE

The species of this subfamily are conspicuous by their peculiar development of the external genital organs. I cannot consider the separation of *Calobata* and *Micropeza* as members of distinct subfamilies, they have too much in common, although it must be admitted that *Calobata* has rather unique characteristics; but it is certainly more closely related to *Micropeza* than to *Taeniaptera*.

Of this subfamily we have the following genera occurring within the scope of the present paper.

MICROPEZA Meigen

1803. *Micropeza* Meigen, Ill. Mag., II, p. 276.
1908. *Tylos* Hendel, Verh. Zool.-Bot. Gesell. Wien, 1908, p. 60 [nec. *Tylos* Meigen, 1800, nom. nud.].
1922. *Necriocephalus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 160.
1922. *Cliopeza* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 162.

GENOTYPE: *Musca corrigiolata* Linnaeus, 1767. [by monotypy].

The primary characteristics of this genus are the elongate head, especially of the female; absence of dorsocentral and propleural bristles; the short third costal section (less than one-half length of ultimate section of fourth vein) and the confluent discal and second basal cells.

I cannot recognize *Neriocephalus* Enderlein nor *Cliopeza* Enderlein, as distinct genera; and *Tylos* is a pure synonym with the same genotype.

Micropeza ventralis new species

A black species with yellow ventral surfaces, easily distinguished thus and by the characters given in the description.

Black including the arista; frons except medianly and third antennal segment, ferruginous; halteres knob, and tibiae basally, brown; face, the broad oral margins, lower part of propleura, prosterna, mesal margins of sternopleura, metasterna, posteriodorsal and ventral margins of tergites, venter, most of genital segments of male, coxae and extreme bases of femora, yellow. Wings slightly brownish.

Head twice as long as high; eyes horizontal; postorbital extension about one-half diameter of eyes. First posterior cell closed at costa.

The typical series is somewhat greasy, but the females show that the upper surfaces are probably opaque, densely dark gray pruinose; mesonotum brownish with a narrow median gray line between two narrow darker ones. Vertex with two narrow shining lines converging anteriorly to narrowest part of frons. Length, 6 to 7 mm.

Type.—Male; Tacubaya, Distrito Federal, Mexico, [U. S. N. M., no. 43149].

Paratypes.—1 ♂, 2 ♀; topotypical.

Micropeza verticalis new species

In general appearance very similar to *producta* but the antennae are pale and the vertex is distinctly cinereous.

Yellow to tawny, subopaque; upper occiput rufous with area behind postverticals and a stripe through outer verticals, yellow; area including ocelli, post- and innerverticals, cinereous; mesonotum rufous with a narrow anterior median yellow stripe; all femora narrowly brown at apices; arista black; halteres brown; tibiae apically, and tarsi, black. Head two and one-half times as long as high; ocelli aligned with posterior orbits and anterior to line of frontals. Claspers of male apparently not developed; first posterior cell closed near to or at costa. Length, 5 mm.

Type.—Male; Barcoa, Cuba, September, 1901, (A. Busck), [U. S. N. M., no. 27070].

Micropeza appendiculata Schiner

1868. *Micropeza appendiculata* Schiner, Reise Novara, Zool., II, p. 250.
1922. *Neriocephalus appendiculatus* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 160.

This is the genotype of *Neriocephalus* Enderlein, 1922, characterized by the elongate head and the closed first posterior cell. I cannot recognize that genus, but the present species is typical of a group in which the thorax is opaque, densely grayish to white priunose, with two to three narrow, median, brown, mesonotal stripes; femora yellow, with distomedian dark rings.

To my knowledge, this group contains *appendiculata* Schiner and *distincta* Schiner from "South America"; *bilineata* van der Wulp, *stigmatica* van der Wulp, *distenta* Cresson, and *biannulata* Cresson, from Central America.

I have not been able to satisfactorily establish this species in the material at a hand, but the essential characters gleaned from the original description are:

Head longer than broad; mesonotum gray with two approximate brown lines; femora yellow with two dark distomedian rings; wings with first posterior cell closed and petiolate. Ovipositor shining black with yellow median ring.

A male from Cotopax, Ecuador, (F. Campos), [U. S. N. M.], may belong here, but its condition is too poor for a very critical description.

Head one and one-half as long as high; eyes round, upper parts brown or ferruginous with oral regions yellow. Third antennal segment yellow; arista white. Eyes round. Mesonotum with two narrow median presutural lines and broad lateral margins, brown; a postsutural median brown line extends onto the scutellum; pleura uniformally cinereous. Femora dark yellow with two distomedian, darker rings; the proximal ring about five femoral diameters from the apex. Claspers of male broad, broadly truncate apically with short, stout tooth-like fingers, the latter twice as long as their basal diameter. Petiole of first posterior cell about as long as anterior crossvein.

Micropeza stigmatica van der Wulp

1903. *Micropeza stigmatica* van der Wulp, Biol. Cent. Amer., Dipt., II p. 367, pl. 9, fig. 17.

In this species we have three fine, brown, median mesonotal lines anterior to the suture, and irregular lateral brown spots; there may or may not be a postsutural median line. Pleura with irregular reflecting brown and white spots. Claspers of male rather slender, with apices attenuated into rather long simple fingers. The first posterior cell may or may not be petiolated. Head of male about twice as long as high; eyes rather rounded. Ovipositor tawny with black apex.

We may have *appendiculata* here. My series agrees somewhat with the description of *M. distincta* Schiner (1868) excepting that the postorbital area is shining black and the mesonotum is bivittate in that species. A critical examination and descriptions of the types of those species should be made by a competent student.

GUATEMALA: Ayulta, April 13, (Aldrich); Ingenio Railroad Station, April 28, (Aldrich); La Providencia, Obispo, April 15, (Aldrich), [all U. S. N. M., 5].

PANAMA: Bella Vista, July to August, (Banks); Fort Sherman, Canal Zone, July 3, (Banks); Gamboa, Canal Zone, (Banks), [all M. C. Z., 11].

MEXICO: Vulcano Còlima, (Conrad), [U. S. N. M., 3].

BRAZIL: Piedra, April, [A. M. N. H., 1].

ARGENTINA: ?Mendoza, (Lichtwardt), [Deut. Ent. Inst., 1]. Potrerillos, Mendoza, 4000 feet alt., March 16, [Cornell, 1].

The Brazilian and Argentinian individuals are apparently conspecific with those from Central America, but the median brown mesonotal line and lateral spots are less distinct. A male also from Colima Vulcano, Mexico, (L. Conrad), [U. S. N. M.], has the claspers large, broad, obtusely pointed apically without definite fingers, or tooth.

This species also occurs in the United States.

Micropeza distenta Cresson

1926. *Micropeza distenta* Cresson, Trans. Am. Ent. Soc., LII, p. 262.

This is very similar to *stigmatica*, but the head of the male is shorter, about one and one-half times as long as high; eyes rounded. It may not be distinct from that species, as there seems to be no other differentiating characters, but my series is not extensive enough to satisfactorily establish that synonymy.

Of this species I have seen only the type series of five males and a female from Taboga, Panama, [U. S. N. M.], and another specimen from La Chorrera, Panama, May 22, (Busck), [U. S. N. M.].

A female from, Head of Rio Piedra Verdes, alt. 7300 feet, Sierra Madre, Chihuahua, Mexico, August 7, (C. H. T. Townsend), [U. S. N. M.], probably represents a distinct species, but its condition does not warrant fuller description nor further consideration than given below. There is seemingly so much variation in this genus that it is not advisable to erect species on a single specimen, especially if it is a female.

Head very elongate; frons yellow, (third antennal segment wanting); mesonotum with two fine median brown stripes, a round spot and two to three more lateral, irregular, spots before suture. Fore femora as in *stigmatica* (middle and hind legs wanting, but a detached leg shows a subbasal brown tibial ring). Ovipositor segment longer than in the Panama specimens, with two round, black spots.

Micropeza biannulata Cresson

1926. *Micropeza biannulata* Cresson, Trans. Am. Ent. Soc., LII, p. 261.

The two mesonotal stripes, the more uniformally cinereous pleura, and the extreme apical infuscation of the femora, will distinguish this species. It is evidently closely allied to *M. bilineata* van der Wulp (1897) described from Mexico.

Only the type series of four males and a female from Higuito, Costa Rica, [U. S. N. M.], are known to me.

METAPOBRACHIA Enderlein

1922. *Metapobrachia* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 161.

GENOTYPE: *Micropeza obscura* Bigot (1886). [Original designation].

This name is retained for a group of species allied to what I consider *Micropeza obscura* Bigot, with the following characteristics:

Head subglobose to slightly elongate triangular, at most twice as long as high; wings broader than in *Micropeza*; third costal section much longer than one-half the ultimate section of fourth vein.

Metapobrachia recta (Cresson)

1926. *Micropeza recta* Cresson, Trans. Am. Ent. Soc., LII, p. 261.

Differing from *obscura* in its longer head (twice as long as high), more slender thorax; the postsutural mesonotal area flattened; arista black; third costal section about three-fourths as long as ultimate of fourth vein.

The subapical flexor spot of the middle and hind femora is often large, occupying the entire apex, as is that of the fore femora. The species is known only from

PANAMA: Alhajuela, April, (Busck), [U. S. N. M., 1]. Porto Bello, March 9, (Schwarz), [U. S. N. M., 2; type series]. Barro Colorado, Canal Zone, July 15 to August 1, (Busck), [M. C. Z., 4].

Metapobrachia subrecta (Cresson)

1926. *Micropeza subrecta* Cresson, Trans. Am. Ent. Soc., LII, p. 261.

The separation of this species from *recta* is so slight that one is sometimes in doubt as to it being distinct; but the differences in the form of the claspers of the male, and the dilution of the apical infuscation of the femora, resulting, in the formation of a subapical ring, seem to be constant. My material of this form, however, is small, consisting of the type series of three males and two females from Higuito, San Mateo, Costa Rica, (Schild), [U. S. N. M.].

Metapobrachia sagittifer (Cresson)

1926. *Micropeza sagittifer* Cresson, Trans. Am. Ent. Soc., LII, p. 263.

In this species we have a form more closely related to *obscura* than are the former two, differing in that the fore femora are uniformally darkened apically, and the hind femora have a

diffused, subbasal, infuscation. There is a distinct median infuscation of the wings.

Known only from the type series of two females from Chapada, Brazil [A. M. N. H.].

Metapobrachia obscura (Bigot)

1886. *Micropeza obscura* Bigot, An. Soc. Ent. France, (6), VI, p. 387.
1897. *Micropeza obscura* van der Wulp, Biol. Cent.-Am., Dip., II, p. 365.
1922. *Metapobrachia obscura* Enderlein, Arch. f. Naturg., 1922, A, Hft. 5, p. 161.

Two specimens (one a female, the other with the apex of the abdomen missing, but probably a male) from Higuito, San Mateo, Costa Rica, (Schild), [U. S. N. M.], are probably this species. They are somewhat faded, being more of a brown than black. From this series, the species may be diagnosed as follows:

Black; face, oral margin, prosterna, metasterna, halteres, apical margins of abdominal segments, coxae, fore femora basally and with a more or less noticeable subapical ring, middle and hind femora with exception of distomedian and subapical rings and a subapical flexor spot, middle and hind tibiae except apices, yellow. Third antennal segment orange; arista white. Shining; vertex medianly, postorbits, postsutural area of mesonotum, supra-notopleural area, lower portion of pleura, more or less cinereous. Abdomen subopaque. Anterior frontal orbits silvery.

Head slightly longer than high, somewhat equilaterally triangular in profile; eyes oblique; frons somewhat produced; occiput convex, not greatly developed. Mesonotum somewhat convex behind suture; no dorsocentrals. Third costal section about four-fifths as long as ultimate of fourth vein; first posterior cell closed at costa. Length excl. ovipositor, 5 mm.

I do not find, in the specimen I think is a male, the fringe of black hairs on underside of head, as described by van der Wulp.

CRYOGONUS Cresson

1926. *Cryogonus* Cresson, Trans. Am. Ent. Soc., LII, p. 264.

We distinguish this from the foregoing genera by the presence of postdorsocentrals, propleural and postorbital bristles, and the relatively short, broad wings, with a long third costal section.

GENOTYPE: *Micropeza formicaria* Rondani, 1864 (as *Cryogonus reedi* Cresson, 1926).

Cryogonus formicarius (Rondani)

1864. *Micropeza formicaria* Rondani, Arch. Zool. Anat. Fisc., Modena, III, p. 42.

1926. *Cryogonus reedi* Cresson, Trans. Am. Ent. Soc., LII, p. 264.

The three females from Chile, (Reed), [U. S. N. M.; type series of *C. reedi*], and a female from Valparaiso, Chile, "Perales, I.25," (A. Fez), [U. S. N. M., "253"], agree well with Rondani's description. The specimens from Chile are paler, not so intensely shining black as is the specimen from Valparaiso.

There is no doubt as to the synonymy of *C. reedi*.

CALOBATA

This genus is not, to my knowledge, represented in the Neotropical life-zone, but is holarctic in distribution. Prior to 1922, it had been the recipient of most of the species not falling in the genera *Nerius* and *Micropeza*, but is now restricted to a group of species very distinct from those constituting the other genera treated in this paper.

ON CERTAIN TROPICAL AMERICAN GENERA OF STENOPELMATINAE, WITH DESCRIPTIONS OF TWO NEW WEST INDIAN SPECIES

(ORTHOPTERA, TETTIGONIIDAE)

BY JAMES A. G. REHN

In 1869 Walker described two genera of anostostomatine Stenopelmatinae, namely *Licodia*,[1] based on two new species, *L. pallipes*, from "St. Domingo," and *L.?? obliqua*, from an unknown locality, and *Lutosa*,[2] based on *L. marginalis* new species, from an unknown locality. For *Licodia*, Kirby subsequently selected *pallipes* as the genotype.[3] In 1888 Brunner von Wattenwyl, in his classic "Monographie der Stenopelmatiden und Gryllacriden," erected two genera of the same general relationships, namely *Pherterus*,[4] based on *Rhaphidophorus cubaensis* de Haan, described from Cuba, and *P. brasiliensis* new species, from southern Brazil, and *Apotetamenus*,[5] based on *A. amazonae* and *A. clipeatus* new species, from Brazil. For *Pherterus* Kirby subsequently selected *cubaensis* as the genotype, and similarly *amazonae* for *Apotetamenus*.[6] In his Catalogue Kirby also synonymized *Pherterus* under *Lutosa*, and *Apotetamenus* under *Licodia*.[7]

In endeavoring to determine a specimen submitted for identification, investigation of the relationship of these generic names was necessary, and it was soon evident that Kirby's action did not have the support of the material before me. I soon found that *Licodia*, even from the unsatisfactory original description,

[1] Catal. Spec. Derm. Salt. Brit. Mus., I, p. 210, (1869).
[2] Catal. Spec. Derm. Salt. Brit. Mus., I, p. 211, (1869).
[3] Synon. Catal. Orth., II, p. 119, (1906).
[4] Verhandl. K.-K. Zool.-Bot. Gesell., Wien, XXXVIII, pp. 255, 282.
[5] Verhandl. K.-K. Zool.-Bot. Gesell., Wien, XXXVIII, pp. 255–283.
[6] Synon. Catal. Orth., II, p. 119, (1906).
[7] Synon. Catal. Orth., II, p. 119, (1906).

was quite distinct from *Apotetamenus*. With Kirby's reference of *Pherterus* to *Lutosa*, as a synonym, I fully agree, as from available material I can detect no differences of more than specific value. In brief the four names involved represent three distinct genera, material of all of which is now before me. The following features will serve to distinguish the genera.

A. Pronotum greatly extended caudad over the other thoracic tergites and the more proximal abdominal segments, in length not less than that of caudal femur. Fastigium (of female) twice as wide as proximal antennal article. Caudal femora with inflated portion occupying three-fourths of femoral length. (Palpi with ultimate article (exclusive of terminal vesicle) distinctly longer than penultimate or antepenultimate.) . . *Apotetamenus* Brunner

AA. Pronotum not greatly extended caudad over the other thoracic tergites and the more proximal abdominal segments, in length not over half that of caudal femur. Fastigium less than twice as wide as proximal antennal article. Caudal femora with inflated portion occupying not more, and usually less, than two-thirds of femoral length.

B. Head broad, in male with mandibles greatly developed, suggesting the genus *Anostostoma*. Fastigium broader, its surface impressed or subimpressed within the margins. Proximal antennal article with internal face bearing a marked subangulate inflation. Eyes projecting distinctly cephalad in both sexes, as seen from dorsum. Cephalic tibiae with dorso-caudal margin unspined except for distal spine. Cerci longer, in female equal to about half of ovipositor length. (Palpi with penultimate article slightly longer than ultimate without terminal vesicle.) *Licodia* Walker

BB. Head deep, narrow, not markedly differing in the sexes. Fastigium narrower, its surface unimpressed, full. Proximal antennal article with internal face having at most but a faint subangulate inflation, the general form basically cylindroid. Eyes not projecting cephalad as seen from dorsum. Cephalic tibiae with one to two spines on dorso-caudal margin in addition to distal spine. Cerci shorter, in female much less than half as long as ovipositor . . . . . *Lutosa* Walker

Of the genus *Apotetamenus* I have before me two females referable to *A. clipeatus* Brunner.[8] The genus *Licodia* is represented in the material in hand by two species, one from Hispaniola, the other from Cuba, both of which are here described. Of the genus *Lutosa* I have before me, from the Hebard collection, a female specimen from Rio de Janeiro, Brazil, determined by Saussure as *Pherterus goeldianus* Saussure and Pictet, which is considered to be a synonym of *Lutosa marginalis* of Walker, the type (male) of *Lutosa paranensis* Rehn, and material of a West Indian species, to be reported at a later date.

Licodia grandis new species (Text-fig. 1.)

A very large, striking insect, twice the size of the originally referred species, *L. pallipes* and *obliqua* Walker, the former described from "St. Domingo," the latter from an unknown locality, both known only from the female sex. The original description of *pallipes*[9] contains no structural features and is almost useless for comparison, as its color features are hardly specifically diagnostic. From the description of *obliqua*,[10] which was assigned to *Licodia* by Walker with a query, the present species differs in tibial spination details, in exact palpal proportions, and in coloration features which are probably not diagnostic. Without material of these species, not now available, further comparison is not possible.

Type.— ♀ ; Coffee Station, Fond des Negres, Massif de la Hotte, Haiti, Hispaniola. July 1, 1929. (C. H. Arndt.) [Academy of Natural Sciences of Philadelphia, Type no. 5492.]

Size very large for genus (body length, exclusive of ovipositor, 35.5 mm.): form as in related genera, moderately robust, from dorsum blunted cephalad, more attenuate caudad: surface moderately, of limbs and ovipositor more decidedly, polished; face, pronotum, mesonotum, metanotum and proximal abdominal tergite with areas of finely crenulate micro-lineate sculpture.

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[8] 1888. *Apotetamenus clipeatus* Brunner, Verh. K.-K. Zool.-Botan. Gesell., Wien, XXXVIII, p. 283. [♀ ; Brazil.]

BRAZIL: Ypiranga, state of São Paulo; October, 1906; (H. Luederwaldt); 1 ♀ ; [A. N. S. P.]. Os Perús, state of São Paulo; October, 1903; (H. Luederwaldt); 1 ♀ ; [A. N. S. P.].

[9] Catal. Derm. Salt. Brit. Mus., I, p. 210, (1869).

[10] Catal. Derm. Salt. Brit. Mus., I, p. 211, (1869).

Head short, broad, relatively deep, mandibles large but not disproportionately developed, greatest width across genae contained one and one-half times in greatest depth of head: clypeus and labrum reaching virtually to mandibular apices and fully covering buccal aperture in cephalic aspect; clypeus symmetrically trapezoidal, its median depth contained nearly twice in its greatest proximal width, its distal width faintly less than median clypeal depth; labrum broad cordiform in outline: fastigium short, broad, cordiform, distinctly broader than eye and slightly more than one and one-half times as broad as proximal antennal article; dorso-cephalic aspect of fastigium broadly and strongly deplanate, the whole area within margining lateral borders and distad of lateral ocelli obliquely flattened, with a faint subcircular proximo-median low elevation; narrow distal extremity of fastigium closely in contact with facial fastigium. Eyes rather small, deep, narrow ovoid in outline, in dorsal aspect moderately produced meso-cephalad. Antennae elongate filiform, three times as long as body with ovipositor; proximal article robust, with obtuse production of internal face very evident, disto-internal face of article obliquely subdeplanate. Palpi elongate, very slender; ultimate joint (exclusive of the terminal bulb) slightly shorter than penultimate joint, which in turn is a third longer than the antepenultimate joint; length of ultimate joint but slightly less than combined length of clypeus and labrum in normal portion; penultimate joint somewhat narrowed proximad, antepenultimate joint slightly arcuate.

Pronotum with cephalic margin of dorsum slightly arcuate, caudal margin of same transversely truncate, length and width of dorsum subequal, in transverse section regularly arcuate, in profile dorsal line is nearly straight, faintly decurving cephalad: lateral lobes in contour undifferentiated from dorsum, shallow; cephalic, ventral and caudal margins of lobes forming a nearly regular arcuation, the curve faintly flattened ventro-caudad; margins of lobes appreciably cingulate. Mesonotum and metanotum with caudal margin transversely truncate; lateral margins strongly arcuate, slightly oblique-subtruncate caudad, lateral margins cingulate to same degree as margins of lateral lobes of pronotum.

Abdomen with ultimate tergite (supra-anal plate) developed as a short, thick, sublinguiform structure, in dorsal view with its lateral margins subparallel, distal margin roughly arcuate, laterad and distad its structure thickened, mesad concavely subexcavate on dorsum. Cerci regularly tapering, distad very slender, reaching caudad as far as middle of ovipositor, ventral surface in proximal half longitudinally canaliculate, this becoming obsolete distad. Ultimate sternite (subgenital plate) short,

outline arcuate subtrigonal, apex narrowly rounded. Ovipositor slightly longer than median length of pronotum and exposed head and mesonotum combined, moderately arcuate, rather narrow, in profile arcuation slightly more marked in distal third than in proximal two-thirds, apices of valves acute, surface of valves smooth.

Prosternum with elongate, subparallel bispinations. Mesosternum and metasternum each bilobate, the former acutely subspiniform, the latter with acute but not spiniform lobes.

Cephalic and median limbs moderately slender, of medium elongation: cephalic femora but slightly shorter than median length of pronotum and exposed section of mesonotum, weakly tapering distad and faintly decurved at apex, subcompressed, ventral margins unarmed: cephalic tibiae slightly longer than the corresponding femora, dorsal surface with two spines (one distal) on cephalic and one distad on caudal margin, ventral margins each with five spines (one distal); auditory foveolae elongate ovoid: median femora subequal to cephalic in length, similarly subcompressed, tapering and faintly decurved distad, caudal genicular lobe spined, ventral margins unarmed: median tibiae slightly longer than the corresponding femora, dorsal surface with cephalic margin bearing three and caudal four spaced spines, one on each margin distal, ventral margins armed as on the cephalic tibiae. Caudal femora but slightly shorter than body, strongly inflated and distinctly bullate in proximal three-fifths, distal section relatively slender, in profile not markedly deepened at apex, in dorsal view appreciably expanding across genicular lobes, greatest depth of femora at proximal fourth and contained three and one-third times in greatest femoral length, internal face of femora subconcave, external face strongly convex; paginal pattern consisting of spaced oblique, ventro-cephalad directed, raised lines, ventro-lateral carina strongly elevated, sharply differentiating lateral face from ventro-lateral one, latter subconcave, at least near carina, with a secondary type of "herringbone" paginal pattern, ventral carina well arcuate in proximal half, unarmed; caudal (internal) genicular lobe spined distad, cephalic (external) lobe with a distinct proximal marginal spine: caudal tibiae straight, but slightly shorter than femora, subquadrate in section, dorsal face slightly widened and somewhat impresso-deplanate within its finely cingulate lateral margins, external margin with twelve large spaced fixed spines, internal margins with ten similar spines, distad of the fixed spines on each margin is a single large articulate spur-like spine, these subequal in length and appreciably hooked at their apices; distal tibial spurs three in number on each side, the dorso-internal half again as long as the dorso-external, both

straight with a very brief "hooking" at their tips, median and ventral spurs much smaller, medio-internal slightly longer than medio-external, the former about a third the length of dorso-internal spur, the ventral pair small and subequal in length: caudal tarsi with metatarsus and succeeding article together subequal in length to disto-dorsal internal tibial spur, metatarsus ventrad with two marked pulvilli, entire tarsal length subequal to one-third of tibial length.

General color of dorsal surface morocco red passing to ochraceous-buff distad on the abdomen and base of ovipositor, the whole of this surface overlaid with an indistinct pattern of fuscous on the pronotum and caudal linings of the same color on the mesonotum, metanotum and abdominal tergites, these linings broader laterad than mesad, the pronotal pattern balanced and sublyrate mesad; fastigium with its disk vinaceous-russet, bordered with fuscous and with a center spot of the same: face, genae, coxae, an area on the pronotal lateral lobes, femoral bases and ventral surface of abdomen ochraceous-buff; ocellar spots pale amber yellow; palpi light ochraceous-buff, mandibles ochraceous-orange tipped with fuscous; eyes fuscous-black; antennae prout's brown, becoming dresden brown distad and russet brown lined with fuscous proximad, proximal and succeeding article of the face color, the former clouded with fuscous on internal surface. Cephalic and median femora distad passing to bay, with dorsal surface of apex contrastingly ochraceous-buff; cephalic and median tibiae bay to auburn, the spines chestnut, fuscous tipped. Caudal femora of dorsal color, paling to ventral color proximad and with dorsal surface of apex strikingly contrasted light ochraceous-buff, ventro-lateral face and most of internal face of ventral color, genicular lobes largely fuscous; caudal tibiae and tarsi ochraceous-buff, on the former heavily overlaid with fuscous-black proximad, the immediate genicular region dull sanford's brown, dorso-lateral cingulate margins pencilled with fuscous-black, spines and spurs chestnut, tipped and lined with fuscous-black. Ovipositor becoming burnt sienna distad. Cerci auburn.

Length of body (exclusive of ovipositor), 35.5 mm.; length of pronotum, 11.7; greatest width of pronotum across lobes, 10.9; length of cephalic femur, 13.5; length of median femur, 13.4; length of caudal femur, 32.8; length of caudal tibia, 30.7; length of ovipositor, 17.3.

The type of this large and striking species is unique.

Licodia cerberus new species (Text-figs. 2–4.)

This is the first true *Licodia* to be known from the male sex, and it is at once evident that in this genus marked dimorphism is found in the sexes in the structure of the head, such as occurs in the Australian genus *Anostostoma*. The present species is far smaller than *L. grandis*, described above, and leaving entirely out of consideration the marked differences in the buccal region of the head, which in every probability are sexual, it differs in the much more elongate and slender cephalic and median limbs, the less robust caudal tibial spurs and proportionately shorter distal spur on each margin of the caudal tibiae, the more attenuate palpi, the narrower fastigium of the vertex and the more slender proximal antennal article.

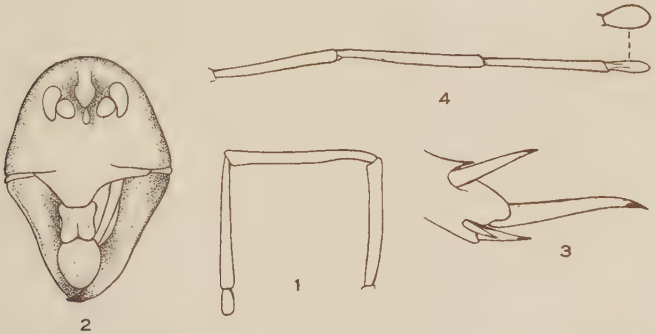


Fig. 1.—*Licodia grandis* new species. Palpus of female (type). Fond des Negres, Haiti. (× 3½.)

Fig. 2.—*Licodia cerberus* new species. Cephalic view of head of male (type). Monte Toro, Guantánamo, Cuba. (× 2½.)

Fig. 3.—*Licodia cerberus* new species. External aspect of apex of caudal tibia of male (type). Monte Toro, Guantánamo, Cuba. (Greatly enlarged.)

Fig. 4.—*Licodia cerberus* new species. Palpus of male (type). Monte Toro, Guantánamo, Cuba. (× 4.)

This Cuban species is somewhat larger than either of the species described by Walker, but as far as can be gleaned from their very unsatisfactory and superficial descriptions *cerberus* is clearly distinct. Walker's *obliqua* is said to have the legs stout, and the pronotum elongate, which certainly would not be true of *cerberus*, while the color features of *pallipes*, which comprise its entire description, show a number of features of difference from *cerberus*.

The generic description of *Licodia*, which probably was based largely on the first species described under it (i.e. *pallipes*), gives eleven spines on the external margin of the caudal tibiae, while *cerberus* has but nine, and *grandis* described above has twelve. The description of *obliqua* gives eight as the number in that species, so, as but two species were then known, it is safe to assume *pallipes* has eleven. It is thus evident that the number of these spines ranges from eight to twelve in the genus.

Type.—♂; Cueva de la Lechuza, San Felipe, Monte Toro, Guantánamo, Oriente Province, Cuba. (C. T. Ramsden.) [Academy of Natural Sciences of Philadelphia, Type no. 5493.]

Size medium (body length, 23.5 mm.): form more slender than in *L. grandis*, but head deeper, more inflated and with the large mandibles asymmetrically developed:[11] surface moderately polished, faintly and finely sculptured with crenulate microlineations on the lateral lobes of the pronotum, and the lateral areas of the meso- and metanota, surface of face and clypeus with larger and distinct, but similar, transverse crenulate sculptural lineations.

Head proportionately very large, deep, transverse, greatest depth to tips of mandibles equal to one and one-half times the width across mandibular bases: occiput moderately inflated transversely, the outline, as seen in cephalic aspect, regularly and subarcuately broadening to the mandibular bases, in profile occiput and fastigium are regularly arcuate, latter decidedly arcuato-oblique declivent cephalad: in dorsal view fastigium is relatively narrow, acute, greatest width (across lateral ocellar spots) distinctly less than fastigial length to same point; surface of fastigium faintly deplanate about a low broad circular median elevation, lateral margins hardly evident; apex of fastigium of vertex very narrow, closely in contact with facial fastigium, which latter with median ocellar spot is appreciably elevated above general facial level: lower face and much of clypeus decidedly concave impressed, in a symmetrical fashion of varying depth, of most marked character transversely at the clypeal base: clypeus asymmetrical, strongly transverse, short, sinistral side very shallow, briefly produced, normally developed section entirely on dextral side, this in outline symmetrically trapezoid,

[11] The asymmetrical character of the mandibles is pronounced, and is shared to an appreciable degree by the maxillae, while the clypeus, as described above, is markedly asymmetrical. This condition of the mouth-parts is apparently normal and not pathological.

its apex transverse truncate: labrum elongate cordiform, apex rounded acute. Mandibles markedly asymmetrical; sinistral arm the larger, more arcuate, heavy, transversely depressed in most of its length, apex broadened at biting surface, somewhat thickened, apical hook-like cusp prominent; dextral arm slighter, straighter and less strongly depressed than the sinistral arm, apex much as apex of latter but less thickened. Eyes much as in *L. grandis* but slightly broader ovoid in outline and more sharply acute-angulate in their cephalic direction as seen in dorsal view. Antennae as in *L. grandis* but not complete in the unique type; proximal article more slender than in *L. grandis*, angular production of internal face of article less developed, surface of same area subcylindrical. Palpi elongate, very slender, ultimate joint (exclusive of terminal bulb) very faintly shorter than penultimate joint, which in turn is a fifth longer than the antepenultimate joint; penultimate article gradually narrowing in proximal two-fifths, more gradually so than in *L. grandis;* antepenultimate joint very faintly arcuate.

Pronotum in general form as in *L. grandis*, but proportionately smaller, more markedly constricted and substrangulate, thus contrasting more strongly with the proportionately larger head; greatest width contained one and one-quarter times in greatest pronotal length; caudal margin of disk broadly obtuse-arcuate, in profile dorsal line of pronotum is faintly and regularly arcuate: lateral lobes in general as in *L. grandis*, ventral margin of same low arcuate with an angulate tendency, ventro-cephalic and ventro-caudal angles obtusely rounded. Mesonotum and metanotum with caudal margins arcuato-truncate; lateral margins obliquely arcuate (mesonotum) to subtruncate (metanotum) dorso-cephalad, ventro-cephalic angle strongly rounded, these margins cingulate as in *L. grandis*.

Abdomen with ultimate tergite (supra-anal plate) relatively small, elongate trigonal, sublinguiform in outline, apex rounded acute, dorsal surface decidedly and entirely excavate, with an impressed medio-longitudinal line in the same depression. Antepenultimate abdominal tergite with its margin produced mesad into a low trigonal, in profile deflexed, lobation, which is narrowly transverse truncate at apex, where it is in contact with a closely placed pair of low, small, but marked tubercles mesad on the penultimate tergite. Cerci relatively stocky, short, but slightly longer than the ultimate sternite, moderately incrassate except for the tapering, compressed, laterad recurved apical sixth; ventral surface longitudinally canaliculate except at extreme base and apex; surface of cerci closely multipapillose. Infracercal plates broad, meeting on median line in proximal half and there subtectate, their internal margins separating in V-shaped

manner distad; divergent disto-lateral margins of plates obtusely arcuate, disto-median angle sharp, virtually rectangulate. Ultimate abdominal sternite (subgenital plate) subcompressed, scoop-like; in ventral view relatively broad proximad and moderately narrowing distad, the lateral margins, which in profile are otherwise largely straight oblique, terminate in dorsad recurved, bluntly acute, well separated, subconical processes, which are appreciably flattened transversely and supplied distad with a number of short spiniform hairs; between these processes the distal margin of sternite is subexcavate, and this area is filled by a sharply differentiated linguiform lappet, which is inverted subsellate in form, with its length hardly greater than its width, its distal margin broadly rounded and its surface distinctly polished: styles inserted briefly ventrad of the above described subconical processes, relatively short, terete subfusiform, slightly depressed.

Prosternum with bispinations appreciably diverging distad. Mesosternum with bispinations sharply diverging. Metasternum with relatively smaller, erect bispinations, relatively close together and hardly diverging distad.

Cephalic and median limbs proportionately more slender and lighter in structure than in *L. grandis*. Cephalic femora subequal to median length of pronotum and exposed section of mesonotum, subequal in depth, faintly arcuate in profile, subcompressed, unarmed ventrad: cephalic tibiae slightly longer than corresponding femora, dorsal surface with three spines (one distal) on cephalic and one distad on caudal margin, ventral margins and auditory foramina as in *L. grandis*, but the latter are proportionately smaller: median femora as described for *L. grandis* but straighter: median tibiae proportioned and armed as in *L. grandis*. Cephalic femora slightly shorter than body, general structure and proportions as in *L. grandis;* genicular lobes spined as in same species: caudal tibiae as in *L. grandis* but less robust, less appreciably widened dorsad, dorso-external margin with ten spaced fixed spines, dorso-internal margin with nine similar spines, distal articulate spur-like spine on each dorsal margin as in *L. grandis;* distal tibial spurs as in *L. grandis* but all somewhat less robust and the median and ventral pairs slightly smaller proportionately: caudal tarsi as in *grandis* but distal joint slightly shorter and lighter proportionately.

General base color of dorsum ochraceous-buff, light buff on sides, venter and limbs; head, face, genae, most of pronotum, mesonotum, metanotum and proximal abdominal tergites overlaid with ochraceous-tawny to deep mars brown. Head with face and areas at mandibular bases and clypeus russet to mars brown, paling on genae to tawny, occiput largely tawny; labrum

and palpi light buff; mandibles ferruginous becoming infuscated distad; eyes bister; antennae tawny, proximal article light ochraceous-buff, all lined more or less indefinitely with cinnamon-brown. Pronotum nearly solidly dark as seen in dorsal aspect with a fine medio-longitudinal pencilling of pale zinc orange; lateral lobes dorsad of the color of disk, ventrad solidly of the pale ventral color, this area not reaching caudal margin of lobes and separated from caudal section of ventral margin by a partially encircling arm of the dark dorsal color. Abdomen paling to buckthorn brown distad, with cerci, infra-cercal plates and ultimate sternite of the ventral pale color. Cephalic and median femora distad and tibiae proximad washed with cinnamon-brown. Caudal femora washed with hazel, progressively so distad and at narrowest point deepening in tone nearly to cinnamon-brown, apex above pale, genicular arches somewhat infuscate, ventro-external face hardly darkened; caudal femora, except for the pale distal extremity and an incomplete pregenicular annulus, dresden brown, becoming cinnamon-brown on extensor surface; spines buffy, tipped with fuscous; spurs of pale base color, narrowly tipped with fuscous.

Length of body, 23.5 mm.; length of pronotum, 8; greatest width of pronotum across lobes, 6.9; length of cephalic femur, 9.1; length of median femur, 9; length of caudal femur, 21; length of caudal tibia, 19.7.

The type of this most interesting species is unique.

REVISION OF THE ENDOMYCHID TRIBE LIESTHINI WITH A DESCRIPTION OF A NEW GENUS AND A NEW SPECIES

(COLEOPTERA)

BY FRANK E. BLAISDELL, SR.

Stanford Medical School, and California Academy of Sciences, San Francisco, California

In 1837, Newman created the genus *Phymaphora* to receive the genotype, *P. pulchella;* Ziegler in 1844 described *puncticollis*, referring it to the genus *Lycoperdina;* Melsheimer described *Lycoperdina crassicornis* in 1847, which later was listed in the Melsheimer Catalogue as *Endomychus crassicornis.* Ziegler, in 1845, also described another new endomychid as *unicolor*, referring it to the genus *Lycoperdina.* Two years later Melsheimer characterized a supposedly new species as *apicalis*, placing it as a *Lycoperdina;* also indicating a new variety as *pallidus.* In 1853, the genus *Rhanis* was erected by LeConte for *unicolor* as the genotype and *apicalis* Melsheimer. In 1857, a species was described as *Phymaphora hæmorrhoidalis* by Guerin; and in 1880, Dr. George H. Horn described *Phymaphora californica.* The writer, in 1916, collected a species in northern California, which is at the present time described as constituting the type of a new genus and a new species.

The material studied in the preparation of the present Revision consists of that in the Museum of the California Academy of Sciences, which includes the collections of Dr. E. C. Van Dyke, J. O. Martin, F. E. Blaisdell, Sr., Albert Koebele and Louis Slevin. The above has been supplemented by a loan of the specimens in the collection of the American Entomological Society of Philadelphia, which included that of the Geo. H. Horn collection with two paratypes of *Phymaphora californica* Horn. Mr. E. R. Leach of Piedmont, California, also submitted what specimens he had in his collection.

All of the comparative measurements given in this paper have been made from carefully prepared camera lucida tracings. The species considered below belong to a group which constitute the tribe Liesthini, of the Endomychidae.

Tribe Liesthini

All of the members of the tribe are smooth and shining, the prevailing color varies from rufo-testaceous to rufo-ferruginous and more or less ornate with piceous to black; in all the species the pubescence is fine, very short, sparse, pale in color and inconspicuous. Antennae 11-jointed. The essential character is the insertion of the antennae before the inner border of the eyes, under frontal margins that are slightly arcuate over the antennal fossae as seen from the side, straight and convergent anteriorly when viewed vertically from above. The mesosternum is bistriate, the striae uniting anteriorly and enclosing a liguliform space on the median line. The sculpturing consists of a fine, sparse punctulation. The eyes are prominent, vertical and feebly ovate. Epipleurae well defined.

Generic synopsis

Tarsi distinctly tetramerous

Anterior coxae contiguous; antennal club of male not modified; a sixth abdominal segment present in both sexes; pronotal disk with two longitudinal linear grooves extending from before the base to the middle ..... *Rhanis* Ziegler

Anterior coxae separated by a prosternal process

Antennal club not modified in the male; small species, form similar in the sexes ..... *Stethorhanis* new genus

Antennal club of the male dilated, flattened and specialized; larger species ..... *Phymaphora* Newman

RHANIS Ziegler

1853. *Rhanis* LeConte, Proc. Acad. Nat. Sci. Phila., VI, p. 360. [Genotype: *unicolor*].

Anterior coxae contiguous, not separated by a prosternal process; antennae similar in the sexes; eyes round. Pronotum with two rather coarse anteriorly and slightly divergent, impressed, linear grooves which extend from before the submarginal basal impression to middle of the disk. Parasutural striae of the elytra a little divergent from apex to base, passing arcuately lateral to the scutellum to join the basal bead. Epipleurae evanescent a

short distance before the elytral apex. Legs moderately short; femora gradually constricted in basal third and subclavate, the anterior the least so; outer angle of the tibial apices rounded; tibial spurs not visible. A small, round and pubescent foveate impression on the metasternum at middle of the posterior margin of each mesocoxa, another and smaller one in the extreme antero-lateral angle.

Male. Anterior tibiae with a small tooth slightly apical to the middle on outer edge of inner surface. Fifth ventral abdominal segment quite deeply, broadly and arcuately emarginate at apex, exposing the sixth segment rather widely.

Female. Tibiae mutic, legs shorter. Fifth ventral segment truncate at apex, briefly exposing the sixth segment.

GENOTYPE: *Rhanis unicolor* Ziegler.

Rhanis unicolor (Ziegler) (Pl. XV, fig. 4; text fig. 7.)

1845. *Lycoperdina unicolor* Ziegler, Proc. Acad. Nat. Sci. Phila., II, Aug., p. 266.
1847. *Lycoperdina apicalis* Melsheimer, Proc. Acad. Nat. Sci. Phila., III, p. 177.
?1806. *Endomychus fuscus* Melsheimer, Cat. Ins. Penn., p. 27, no. 565. [not descr.]
1853. *Rhanis unicolor* LeConte, Proc. Acad. Nat. Sci. Phila., VI, p. 360, 1.
?1857. *Phymaphora haemorrhoidalis* Guerin, Thom. Archiv. Ent., I, p. 275.
1858. *Rhanis unicolor* Gerstaecker, Entomogr., p. 394, 1.
1873. *Rhanis unicolor* Crotch, Trans. Amer. Ent. Soc., IV, April, p. 362.

Form oblong-oval, moderately elongate, one and three-fourths times as long as wide, elytra moderately narrowed from middle to apex. Prevailing color rufous to rufo-ferruginous; head above and under surface of body more or less suffused with piceous; under surface of head, prosternum and last three abdominal segments usually paler; marginal beads sometimes more or less piceous; elytra more or less nigro-piceous, usually paler at base and apex, as well as along the suture, scutellum rufous to piceous; antennae and legs more or less rufo-testaceous to rufo-piceous; eyes black as usual.

Pubescence very short, fine, pale, sparse and very inconspicuous, most abundant and a little longer on femora and tibiae; posterior margin of propleurae fimbriate with longer hairs which are appressed to the mesepisternum; apical margin of prosternum likewise fimbriate with hairs appressed to gular surface; hairs moderately abundant on fourth and fifth abdominal segments.

Head transverse, usually well retracted into the prothorax, even to the eyes, as wide as pronotal apex; frons feebly and evenly convex; sides quite straight, convergent and finely beaded before the eyes, as viewed from above; surface sparsely and very finely punctulate; frontal suture distinct, evenly arcuate and

feebly impressed; clypeus transverse, sides straight and anteriorly convergent, apex truncate, surface similar to the frons; labrum slightly transverse with apex evenly arcuate. Eyes moderately small and prominent, rather coarsely faceted and slightly irregularly rounded in outline. Antennae moderately long, extending almost to the pronotal base, club three-jointed, funicle rather slender; first joint slightly robust, second, third and fifth rather elongate, second and third about twice as long as wide and subcylindrical, fifth about a half longer than wide, remaining funicular joints similar in form and length, scarcely longer than wide; club elongate, ninth joint triangular, scarcely longer than wide, tenth triangular and wider than long, about a third wider than the ninth, eleventh slightly oboval, not wider than the tenth and about a third longer than wide.

Pronotum about a third wider than long, widest at or slightly before the middle, not as wide as the elytra; apex slightly arcuate, becoming broadly and feebly sinuate toward the obtusely rounded apical angles, which are not the least prominent anteriorly, margin very finely beaded; sides evenly and moderately arcuate in apical two-thirds, thence a little convergent, feebly and broadly sinuate, becoming parallel before the slightly acute basal angles, marginal bead moderately fine and not broadened before the base; the latter about a fourth wider than the apex, transverse, slightly sinuate in outer fourths, rendering the angles a little prominent posteriorly, marginal bead narrow and slightly reflexed; disk evenly and moderately convex, rather arcuately declivous antero-laterally, also posteriorly between the obsolescent carinae bounding the basal impressions laterally; the latter rather broadly impressed and concave at bottom; narrowly and transversely impressed against the basal bead; two coarse and longitudinal linear impressions begin at the anterior margin of the transverse basal impression, each about opposite the lateral angles of the scutellum and extending anteriorly with slight divergence to about the middle of the disk; surface sparsely, finely and evenly punctulate, that which is lateral to the basal impressions and carinae scarcely inwardly declivous.

Elytra about two-thirds longer than wide, widest at or slightly before middle, at base a little wider than pronotal base; base transverse, beaded, posterior margin of bead coarsely crenate on posterior margin; humeri obtuse and not in the least prominent; sides broadly and moderately arcuate, converging a little anteriorly to base, less strongly and more gradually so to the obtusely rounded apex; a few widely spaced, small and short setae are scattered along margin in apical third; disk moderately convex on dorsum, more strongly and arcuately declivous laterally, very gradually less arcuate apically, surface finely, sparsely and evenly punctate; parasutural striae rather fine, not strongly

impressed, entire, subparallel, slightly divergent from apex to base, passing arcuately lateral to scutellum to join the basal bead. Scutellum a little transverse with apex rounded.

Under surface of body very sparsely, irregularly and obsoletely punctulate. Mesosternal striae (Text fig. 7) subparallel, slightly arcuate, becoming more convergent in anterior third and arcuately continuous at apex, interstrial surface glabrous and more or less plane. Legs rather short; hind tarsi about two-thirds the length of their tibia.

Male. A little more elongate, elytra rather more narrowed apically. First abdominal segment about as long as the second and third taken together; second, third and fourth subequal in length; fifth deeply, broadly and evenly arcuately emarginate at apex, at middle equal to length of fourth; sixth segment not quite equal to the combined length of the fourth and fifth at middle. Legs slightly longer, femora more evidently subclavate; dorsal border of anterior femora quite strongly arcuate; anterior tibiae subcylindrical in basal half with a distinct bend close to the articulation and a subacute tooth just beyond middle on inner side.

Female. Somewhat less elongate, eyes more convex beneath. Elytra rather less narrowed apically. First abdominal segment behind the coxae about as long as the second and third taken together, the latter subequal in length; fifth broadly arcuato-truncate at apex and about a half longer than the fourth; sixth segment briefly exposed. Legs shorter, femora less subclavate.

Measurements. Length 2.5 mm.; width 1.2 mm.

Type.—Sex not given; collected in "Pennsylvania."

Location of type not known to the author. It must have been more or less immature. It was described as "reddish-yellow" in color with the antennae yellowish-brown. No special mention was made regarding the color of the elytra, which must have been of similar color to warrant the specific name. Fully pigmented specimens have the elytra dark piceous to black, with the basal and apical areas more or less pale.

Distribution.—New York: Central, Aug. 9, 1891. Maryland: Plummer's Island, May 30, 1909, [Blaisdell]. District of Columbia. Pennsylvania: Lawndale, Aug. 5, 1912, (G. M. Greene), [Coll. Amer. Ent. Soc.]. North Carolina: Black Mountains, September 25, (Beutenmuller). Louisiana: (Hart.). Virginia: Fredericksburg, May, 1902.

Notes.—The genus *Rhanis* is monotypic. I have been unable to find any mention in the literature of a sixth abdominal segment. It is surprising that it should have been overlooked in this American genus.

In *unicolor* the dark color of the elytra varies greatly and on account of this fact Melsheimer described the following species, only the color being considered as germane to the present discussion:

L. apicalis. Testaceous yellow; elytra black, with the apex testaceous; scutellum black.

He indicated also the following:

Var. *a.* Entirely testaceous.

Endomychus pallidus is mentioned in his manuscript, which I consider a case of immaturity and as such is not uncommon.

The eleven specimens before me, belonging to the American Entomological Society, consist of eight males and three females; seven of these are labelled "Horn Coll., H 3178." Three specimens show immaturity, one being entirely pale testaceous in color, the other two show some piceous clouding of the elytra in basal half; the other eight have the elytra dark piceous and distinctly rufous at apex and base.

STETHORHANIS new genus

Anterior coxae separated by a prosternal process, antennae similar in the sexes; eyes unevenly rounded at base; maxillary palpi 4-jointed, first joint short and minute, the others incrassate, fourth subconical, flattened and rounded at apex. Epipleurae well defined, becoming evanescent opposite the apex of the fourth ventral segment. Metasternum with a small, round impressed pubescent fovea against the middle of middle coxae; another in its extreme antero-lateral angle. Apex of fourth ventral abdominal segment transverse and straight; fifth rounded at apex; a sixth segment not visible. Legs rather short, anterior and middle femora subclavate, the posterior longer and clavate; external angle of the tibiae rounded with the apex; anterior trochanters with a small subacute setigerous dentiform projection.

Male. Anterior and posterior tibiae narrow and cylindrical in basal half; the anterior slightly arcuate and with a minute dentiform salient at inner apical angle; middle tibiae straight and very gradually widened to apex.

Female. Tibiae mutic, straight and very gradually widened to apex.

GENOTYPE: *Stethorhanis vandykei* new species.

Stethorhanis vandykei new species (Pl. XV, fig. 1; text figs. 5, 10, 11.)

Form oblong-oval, slightly robust, one-half longer than wide, less elongate than *Rhanis unicolor* Ziegler which it resembles more than *Phymaphora* Newman; glabrous and shining throughout. Color varying from lighter to darker rufous, with a feeble longitudinal piceous cloud on the mid-line of the pronotum; each elytron with similar postbasal cloud and another at posterior third, these may connect by diffusion, usually obsolescent; sterna more or less clouded with piceous. Pubescence very short, pale, sparse and very inconspicuous, evenly distributed.

Head transverse, as wide as pronotal apex; frons evenly convex, very finely and sparsely punctulate; sides before the eyes straight and moderately convergent; frontal suture distinct, arcuate and moderately impressed; clypeus transverse, sides straight and convergent, apex transverse. Eyes moderate in size, strongly convex, prominent and rather coarsely faceted. Antennae moderate in length, about equal in length to width of pronotum, last three joints forming a club; visible portion of the first joint short and robust, a little longer than the second; the latter to the fifth inclusive, short and slightly obconical; second about twice as long as wide, a little stouter than either of the succeeding six joints, third about as long as the second, fourth and fifth about as long as wide; sixth, seventh and eighth more rounded and as long as wide; ninth and tenth transverse, ninth a little more than twice as wide as the eighth, tenth wider than the ninth and eleventh, the latter short oval, about a third longer than wide and as wide as tenth, slightly narrowed and rounded at apex.

Pronotum about a half wider than long, widest before the middle; apex transverse, emarginate between the rather obtuse and prominent angles; sides evenly arcuate in anterior two-thirds, thence straighter and slightly convergent, becoming subparallel before the basal angles, which are rectangular; base transverse, a little wider than apex and rather coarsely beaded; disk rather moderately convex anteriorly, less so posteriorly and feebly declivous toward base within the lateral carinae, the latter bound the distinct basal impressions laterally; surface narrowly impressed before the basal bead between the carinae, impression bipunctate, punctures quite equidistant with the carinae, the latter well marked and almost a third as long as the disk; surface very sparsely punctulate, punctules somewhat variable in size, that between the carinae and lateral beads not impressed.

Elytra about one-half longer than wide, widest at middle and about two and a half times longer than the prothorax; base equal to that of pronotum; sides moderately strongly and evenly arcuate to about posterior third, thence more gradually arcuate and convergent to the subparabolically rounded apex; disk moderately convex on the dorsum, more strongly so and arcuately declivous laterally, parasutural striae well impressed, entire, slightly divergent from apex to base, ending against the scutellum; surface finely, irregularly and sparsely punctulate. Scutellum transverse and rounded at apex.

Under surface of the body glabrous and extremely finely to obsoletely, sparsely punctulate. Mesosternal striae subparallel, converging anteriorly and arcuately united beneath apex of the prosternal process, interstrial surface plane (Text fig. 5). First abdominal segment behind the coxae as long as second and third taken together; third and fourth subequal and together about equal to length of fifth.

Legs moderately short, femora slightly inflated in apical two-thirds; posterior tibiae slender, slightly and gradually widened apically, the anterior dissimilar in the sexes (Text fig. 11). Tarsi about two-thirds the length of their tibia. Tibial spurs not visible.

Sexual characters are only observed in the anterior tibiae:

Male. Anterior tibiae (Text fig. 10) slightly arcuate, a little dilated in apical half and slightly arcuate on inner surface, a small dentiform salient present at inner apical angle; narrower and more rounded in basal half, noticeably slightly bisinuate on inner surface.

Measurements. (Holotype), Length 2.4 mm.; width 1 mm.

Holotype.—Male, no. 2653, and allotype, female, no. 2654, in the author's collection, Museum of the California Academy of Sciences. Collected by F. E. Blaisdell, June 11, 1916, at Green Point Ranch, on Redwood Creek, Humboldt County, California.

Paratype.—One female, with the same data as the types.

Habitat.—On fungus beneath bark.

From other members of the tribe Liesthini, *vandykei* can be recognized by its pale color, shorter and more robust form. From *Rhanis unicolor* it is separated by the presence of a prosternal process between the anterior coxae; from the species of *Phymaphora* by its small size, uniform color and similarity of the antennae in the sexes.

PHYMAPHORA Newman

1837. *Phymaphora* Newman, Ent. Mag., v, p. 389. [Genotype: *pulchella*. Male figured].
1853. *Phymaphora* LeConte, Proc. Acad. Nat. Sci. Phila., vi, p. 360, 1.
1858. *Phymaphora* Gerstaecker, Entomogr., p. 397, 1.
1873. *Phymaphora* Crotch, Trans. Amer. Ent. Soc., iv, April, pp. 359–362.

Anterior coxae separated by a prosternal process (Text fig. 6), antennae dissimilar in the sexes. Eyes unevenly and slightly ovate in basal outline. Muzzle short; maxillary palpi 4-jointed, first joint very small and slender, the others incrassate, the third short and obconical, fourth conical with apex truncate; labial palpi 3-jointed, first joint shortest, the second incrassate, third subconical. Newman states that the mandibles (Text fig. 14) are strong with apices incurved, bifid, with two minute teeth within and subapical, then an increase in diameter due to the presence of a large membranous lobe, base prominent within due to a serrulate molar; maxillary lacinia small, linear with apex pilose; galea similar, a little larger and a little longer. The parasutural striae slightly divergent anteriorly from apex to base, and terminate against the scutellum; superior margin of epipleurae well defined, evanescent opposite apex of third ventral abdominal segment; ventral sutures straight, fifth ventral arcuate at apex. Legs moderate in length; femora clavate, the posterior attain apex of the fourth ventral segment; outer apical angle of tibiae rounded; tibial spurs not visible.

Male. Legs longer, femora narrowed at base; middle tibiae with a small tooth near tip and on the posterior a slight angulation at apical third. Antennal club 4-jointed, greatly dilated and flattened, concave beneath and capable of flexion, apparently to grasp the antennal club of female.

Female. Antennal club 3-jointed, not modified nor specialized; anterior tibiae mutic.

GENOTYPE: *Phymaphora pulchella* Newman.

Phymaphora pulchella Newman (Pl. XV, fig. 2; text figs. 6, 13, 14.)

1837. *Phymaphora pulchella* Newman, Ent. Mag., v, p. 389. [Male figured].
1844. *Lycoperdina puncticollis* Ziegler, Proc. Acad. Nat. Sci. Phila., ii, p. 271.
1847. *Lycoperdina crassicornis* Melsheimer, Proc. Acad. Nat. Sci. Phila., iii, p. 176, 4.
?1806. *Endomychus crassicornis* Melsheimer, Cat. Ins. Penn., p. 27. [not descr.].

Form oblong-suboval, slightly more than one-half longer than wide. Color rufous to rufo-ferruginous, sometimes paler from immaturity; upper surface of head, marginal beads, scutellum and under surface of body, especially the meso- and metathorax and parapleurae, more or less tinged with piceous; eyes black

as usual. Pronotum with a median nigro-piceous cloud varying more or less in extent, usually sharply defined at sides. Elytra ornate with a broad transverse nigro-piceous fascia, the greater part of which extends before the middle, borders of which are more or less undulated; another fascia of similar color transversely involves the apex, anterior border of which is more or less lobed in lateral thirds of the width, narrower than the median fascia; the two fasciae may connect along the lateral margins, at times extending along the suture, involving the interstrial space even to the scutellum. In immature specimens the dark areas are more or less obsolescent. Pubescence fine, very short, pale and very inconspicuous; longer on the antennae, clypeus and labrum.

Head transverse, usually more or less retracted to the eyes within the prothorax, about twice as wide as long; sides of frons before the eyes very short and convergent, finely beaded; muzzle quadrate, sides of clypeus straight and parallel; frons slightly convex, most so on the vertex, broadly, feebly impressed and very slightly declivous between the feebly marked supra-antennal convexities, sparsely and evenly punctate, punctures small; frontal suture arcuate and distinct; clypeus transversely oblong, apex truncate; labrum transverse, apex evenly arcuate. Eyes rather abruptly prominent, unevenly rounded at base and scarcely oval, facets moderate in size. Submental region transversely prominent at base of mentum and declivous with the transversely impressed gular region. Antennae dissimilar in the sexes.

Pronotum subquadrate, widest in apical third, narrowed posteriorly, about a third wider than long, base about a fourth wider than apex, the latter transverse in feeble circular arc and briefly sinuate within the angles, not beaded; apical angles obtusely rounded and not prominent; sides moderately and evenly arcuate in apical half, thence straight and convergent, somewhat feebly and broadly sinuate to the basal angles, marginal bead rather strong, very gradually broader at base; basal angles rectangular; base transverse, marginal bead rather wide and flat between the very short discal carinae, its surface shows a row of punctules; disk moderately convex, slightly declivous and broadly, extremely feebly impressed at the apical angles, noticeably, but feebly declivous posteriorly between the rather strong basal impressions, the latter bounded laterally by short and more or less obsolescent carinae; surface lateral to the carinae scarcely inwardly declivous; narrowly and strongly transversely impressed before the basal bead, floor of impression equidistantly punctulate between the carinae, the two median punctules opposite to the basal angles of the scutellum; general surface very finely, sparsely punctulate. Median line of the disk somewhat broadly and evanescently impressed in middle third.

Elytra widest at about the middle, two-thirds longer than wide and two and three-fourths times as long as the pronotum; sides broadly arcuate, converging a little toward base, more gradually so to the rounded apex; parasutural striae moderately impressed, entire, slightly but gradually divergent from apex to base, ending against the scutellum; elytral base a little wider than that of the pronotum, humeri rounded; surface evenly, finely and sparsely punctate. Scutellum slightly transverse, apex rather parabolically arcuate with sides slightly incurved at base, surface with few punctules, a very small elytral setigerous puncture against the basal angles.

Under surface of body very finely, sparsely and obsoletely punctulate. Abdominal surface extremely finely and microscopically reticulate; length of ventral segments somewhat different in the sexes. Legs moderate in length, somewhat subclavate, especially the posterior which are noticeably narrowed in basal half; anterior femora somewhat inflated and not clavate. Fifth abdominal ventral rounded at apex; hind tarsi a little less than two-thirds the length of their tibia.

Male. Recognized by the greatly dilated and flattened, 4-jointed antennal club. Antennae a little longer than the head and prothorax and quite equal to the elytral width; club distinctly longer than the funicle; first joint of the latter stout, a little longer than wide, second less so and slightly stouter than the following joints, about equal in length to the third and fourth taken together, but slightly wider; joints three to seven inclusive transverse, quite equal in width and length; first joint of the club very short and transverse, second very large and nearly equal to the combined length of the third and fourth, its anterior border as long as the terminal joint, the third transverse, about one-half as long as the greatest length of the second; third and fourth a little narrower than the second, fourth irregularly rounded and scarcely wider than long. Second, third and fourth ventral abdominal segments quite equal in length, fifth about equal to the combined length of second and fourth. Anterior tibiae mutic, merely a slight thickening noticeable; middle with a small tooth near apex and on the posterior a slight angulation at apical third.

Female. Antennal club 3-jointed and unmodified; first and second joints transverse and subequal in length (Text fig. 13), third irregularly rounded. First funicular joint stout, second obconical and about a half longer than wide, as long as the width of the first; joints three to seven inclusive subequal in length and width, eighth a little larger and about as long as wide. Third and fourth ventral abdominal segments equal in length, second slightly longer, fifth about equal to the third and fourth taken together. Tibiae mutic.

Measurements. Length 3.2 to 3.5 mm.; width 1.4 to 1.2 mm.

Type.—Male. According to the Supplementa Entomologica (Walther Horn), the Edward Newman collection "ex parte via Ent. Club an Brit. Mus., ex parte via Hope an Hope Mus. Oxford." Mr. Doubleday collected three specimens at Trenton Falls (type locality), New Jersey.

Distribution.—"Eastern States." New York: Buffalo, [Coll. Amer. Ent. Soc.]; Hamburg, Nov. 27, 1901, (E. P. Van Duzee). Pennsylvania: Bear Lake. Virginia: [Coll. Amer. Ent. Soc.]. The Leng Catalogue gives "Middle and Southern States; Indiana, Canada and Manitoba." Blatchley states that it is scarce in Possey County, Indiana, May 11, and usually occurs on old beach logs.

In the small series before me, belonging to the American Entomological Society, three are males and five, females. Three are labelled "Horn Coll., H 3179." Three of the specimens are from Virginia and all have the head piceous in color; one has the scutellum and the entire elytral suture blackish. Two of the eight specimens are moderately immature. The discal pronotal, oval, black cloud is well marked in five of the specimens, in four occupying the middle third and in one the cloud is broader and more oblong, located in the middle two-fourths of the disk.

Notes.—The species described by Ziegler and Melsheimer are only color variations and therefore forms and synonyms. In order to render the characters upon which they are based directly accessible, I shall review them as follows, giving first of all Newman's original description of his genotype:

Phym. Pulchella. *Lætè ferruginea, glabra, nitida; oculis vertice, elytrorum fasciâ latâ mediană alteraque apicali nigris: Elytra juxta suturam utrinque profundè l-striata* (Corp. long. .15 unc.: lat. .05 unc.).

From what I have indicated in the above specific description, the species varies in extent of the nigropiceous maculation, the general coloration being more or less suffused with piceous.

The essential characters of Ziegler's species are as follows:

Puncticollis Ziegler: Thoracic disk and two spots on each elytron black. A large black oblong-oval spot, arising from base of the pronotum and extending to or beyond the middle. Scutellum blackish brown. The elytral two black spots confluent on the lateral margin and suture, the smaller one placed at tip

and the other in the middle; posterior margins of the three first ventral segments blackish. Length 1¾ lines; breadth ¾ lines.

He indicated the two following varieties:

Var. a. Antennal club and head tinged with black.

Var. b. Thoracic spot broader, less regularly formed, and reaching near the apex; the spots on the elytra run nearly together, having but a small space between them.

Melsheimer's species was based upon the following variation in maculation:

Crassicornis Melsh.—Disk of the thorax, a fascia and tip of the elytra, black. Head frequently dusky; thorax with the disk black; scutellum black; elytra with a broad common fascia on the middle, apex and anterior portion of the suture, sometimes its entire length, black. 1½ l. long. The following variety was defined by him:

Var. a. Smaller; apex of the elytra and scutellum color of the elytra.

It is to be understood that the general character of form, punctuation and pubescence are the same in all the specimens; the coloration in all cases varies from rufotestaceous to rufo-ferruginous and the characters used by Ziegler and Melsheimer are based upon the degree of diffusion of the dark markings with tinging by piceous. These all constitute what I term *forms:* specific units which vary in some degree of body form, size, color or sculpturing from the type. I have before me specimens in which the dark markings are absent, these are either immature or are instances where pigmentation failed to develope for some reason, probably from an environmental or meteorological condition, one or both. The bibliography gives the changes in nomenclature.

Phymaphora californica Horn (Pl. XV, fig. 3; text figs. 8, 9, 12.)

1880. *Phymaphora californica* Horn, Trans. Amer. Ent. Soc., VIII, May, pp. 142–143, Pl. 3, fig. 5*a* [male].

Form oblong-suboval, slightly more than one-half longer than wide. Color rufous to rufo-ferruginous, sometimes rufo-testaceous; marginal beads, occiput, scutellum and under surface of body, may be more or less tinged with piceous; eyes black; pronotum with a median nigro-piceous cloud varying more or less in size, at times extending from apex to base; elytra with a broad transverse nigro-piceous median fascia, borders of which are more or less strongly undulate, another narrower one involving the apex, laterally the two fasciae may connect along the lateral margins, at times extending along the suture to the scutel-

lum; in immature specimens these dark areas may be more or less obsolescent. Pubescence more or less evenly distributed, fine, pale, very short and extremely inconspicuous, slightly longer on clypeus and labrum.

Head transverse, as wide as the prothoracic apex; sides almost straight and convergent before the eyes, finely beaded; frons slightly convex, most so on the vertex, sparsely and evenly punctate, punctures small; frontal suture arcuate and distinct; clypeus transverse, sides straight and anteriorly convergent, apex truncate; labrum convex and arcuate at apex. Eyes prominent, slightly oval at base, facets moderate in size; base of mentum and maxillae transversely prominent, submental region declivous, gular surface transversely impressed. Antennae dissimilar in the sexes.

Pronotum subquadrate, widest at apical third, narrowed posteriorly, about a fourth wider than long, base slightly wider than the apex; the latter broadly and feebly emarginate between the scarcely prominent and obtusely rounded angles, not distinctly beaded; sides less than moderately arcuate in apical half, thence feebly convergent, almost straight to feebly sinuate before the rectangular basal angles, marginal beads widening to base opposite the basal impressions; base transverse, marginal bead rather broad and flat between the carinae, surface with few scattered punctules; disk moderately convex, slightly declivous antero-apically, very slightly and broadly declivous basally between the lateral basal impressions, the latter moderately deep and concave, bounded laterally by the short carinae; surface between the carinae and lateral marginal beads feebly or scarcely impressed; rather narrowly and transversely impressed before the basal bead, the impression with a row of widely spaced punctures. General surface sparsely and evenly punctate, punctures small, slightly larger centrally.

Elytra widest at about the middle, about a third longer than wide, moderately and evenly convex; sides rather evenly and moderately arcuate, converging a little to base, evenly arcuate and gradually convergent to the rounded apex; parasutural striae well impressed, diverging a little from apex to base, ending against the scutellum; surface finely, somewhat distantly punctate. Scutellum slightly transverse, apex arcuate, sides slightly incurved at base; surface with few punctules; a small punctiform elytral impression against the sides at base.

Under surface of the body very finely and sparsely punctulate, punctules slightly coarser on prosternum. Abdominal surface very finely microscopically reticulate. Legs moderate in length, femora somewhat subclavate, especially the posterior which are noticeably narrowed in basal half. Posterior tarsi two-thirds the length of their tibia.

Male. Recognized by the greatly dilated and flattened antennal club, the joints concave beneath. Antennae a little longer than the head and prothorax, about equal to the width of elytra, club and funicle quite equal in length. Club 4-jointed, first joint very short and transverse, second suddenly larger with its posterior side longer than the anterior, third equally broad, much shorter and as long as anterior border of the second, fourth a little narrower, slightly wider than long and somewhat irregularly rounded apically; joints of the funicle almost as long as wide, subequal in width, the second a little longer than any of the following joints. Third and fourth ventral abdominal segments together subequal to the second; the first behind the coxae and the fifth, each about equal to the combined length of the third and fourth. The anterior tibiae armed with a small tooth on inner side near tip; a small tooth near tip of the middle tibiae and a slight angulation at apical third of posterior tibiae. Posterior femora rather elongate.

Female. Unmodified 4-jointed antennal club (Text fig. 12) and mutic femora. Third and fourth ventral abdominal segments equal, second slightly longer; first segment behind the coxae about equal to the combined length of the second and third; fifth about a half longer than the fourth.

Measurements. (Male) Length 3, 5 mm. (Horn.)

Holotype.—Male, in the Horn Collection of the American Entomological Society, collected by H. K. Morrison, at San Francisco, California. [Type No. 3162.]

Paratypes.—Two females, nos. 3162–2 and 3162–3, also in the Horn Collection; collected by Morrison in Nevada.

Distribution.—The series in the collection of the Museum of the California Academy of Sciences, present the following distributional data:

California: Hills back of Oakland, Alameda County (Van Dyke). Muir Woods, Marin County, May 4, 1913 (Martin). Santa Cruz County, Nov. 16, 1919. Strawberry Valley, Eldorado County (Van Dyke). Carville, Trinity County (Van Dyke). Dunsmuir, Siskiyou County, May 27, 1914. Atwood's Mill, Tulare County, July 6, 1913. Lake Tahoe, Eldorado County, June 15–27, 1913. Sequoia National Park, alt. 7000–8000 ft. Huntington Lake, Fresno County, July 15, 1919, alt. 7000 ft. (Van Duzee). Blood's Meadow [now Lombardi's Meadow], Alpine County, July 15, alt. 7000 ft. (Blaisdell).

The material in the loan from the American Entomological Society presents the following additional distributional and variational facts:

California, 2; Washington, 1; Nevada, 2.

The series including the paratypes consists of seven specimens: six females and one male. Nevada specimens are more strongly and slightly more coarsely punctured and, the lateral pronotal margins opposite to the basal impressions are rather more strongly reflexed, than in the California specimens. The two California and the Washington specimen bear the "Horn Coll., H 3160" label. One of the California specimens is ver yimmature and of a pale testaceous color, with this exception the general coloration is rufo-ferruginous, varying slightly in degree. The maculation is dark piceous to black, sharply defined, consisting of the usual broad median transverse vitta, the apical spot, on the elytra, connected more or less narrowly along the lateral margins and on the suture; the resulting enclosed pale spots varying in size. The median, oval, black discal pronotal cloud is sharply defined and does not attain the apical nor the basal margin, but shows some variation in size. The only exception, is the Washington specimen, here the discal spot is absent and there is a moderate diffused piceous tinge to the whole disk.

The chief differences between the two species of *Phymaphora* may be expressed in the following synoptical statement of the male characters:

Antennal club distinctly longer than the funicle; second joint very large and nearly equal to the third and fourth together; anterior tibiae mutic..... *pulchella* Newman

Antennal club quite equal to the funicle in length; second joint smaller, about as long as the terminal joint; anterior tibiae armed with a small salient on inner side near apex. *californica* Horn

The two species are quite alike in character of body form, color, maculation, punctuation and pubescence.

Explanation of Plate XV

Fig. 1.—*Stethorhanis vandykei* new species. (× 25.)
Fig. 2.—*Phymaphora pulchella* Newman. (× 25.)
Fig. 3.—*Phymaphora californica*. (× 24.)
Fig. 4.—*Rhanis unicolor* Ziegler. (× 30.)

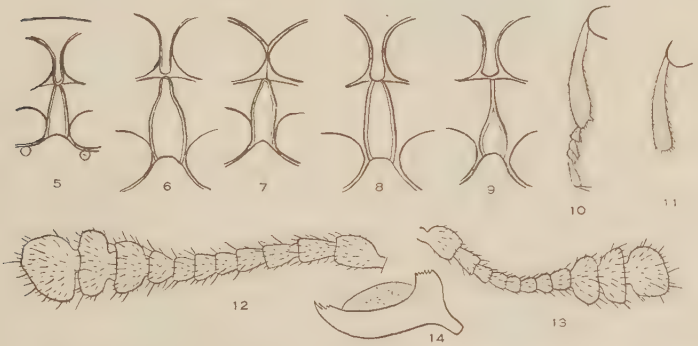
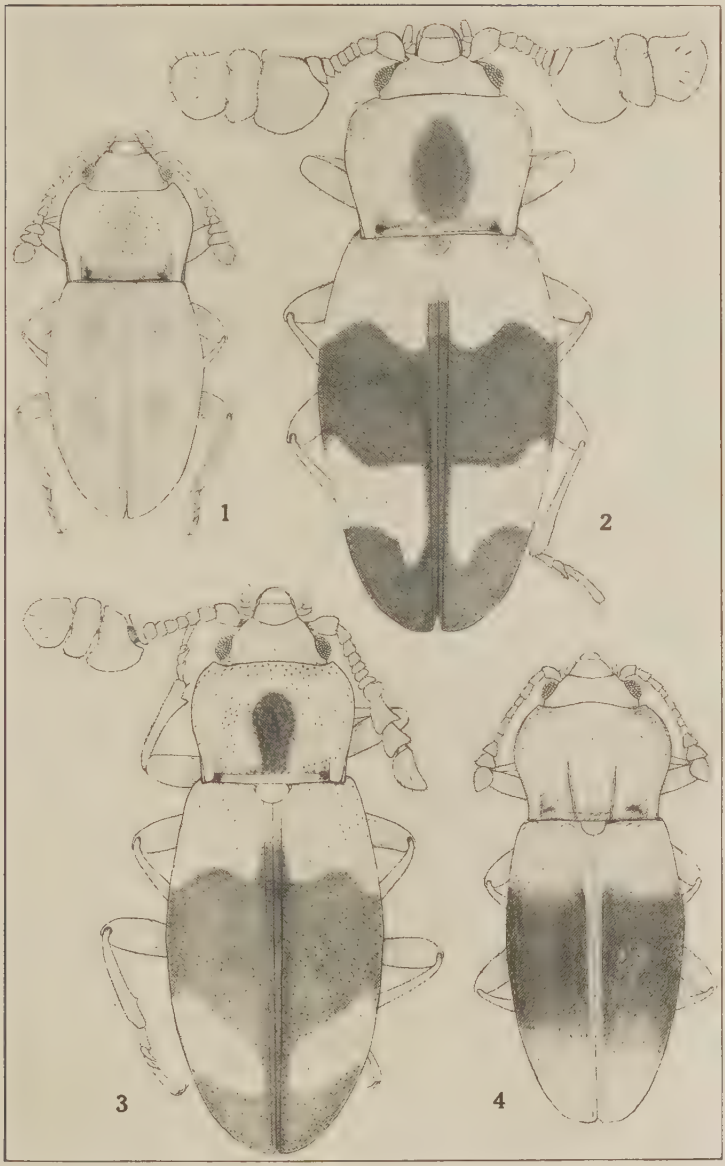


Fig. 5.—Camera lucida outlines of pro- and mesosternum of *Stethorhanis vandykei*. Fig. 6.—Same of *Phymaphora pulchella*. Fig. 7.—Same of *Rhanis unicolor*. Fig. 8.—Same of *Phymaphora californica*. Fig. 9.—Same of a variant of *Phymaphora californica*. Fig. 10.—Anterior tibia and tarsi of *Stethorhanis vandykei*, male. Fig. 11.—Anterior tibia of *Stethorhanis vandykei*, female. Fig. 12.—Right antenna of *Phymaphora californica*, female. Fig. 13.—Left antenna of *Phymaphora pulchella*, female. Fig. 14.—Mandible of *Phymaphora pulchella*, after Newman.



BLAISDELL—NORTH AMERICAN LIESTHINI

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